THE IRON TRADE REVIEW

VOLUME XXXVI CLEVELAND, OHIO, JULY 30, 1903 NUMBER 31

THE WEEK IN IRON CIRCLES.

THE MARKET AT LARGE.

The sensational fall in securities the past week and the acute feeling of pessimism attending it, have begotten no corresponding sentiment in the iron trade, but naturally they have not helped to break the lull in the market. No noteworthy business has resulted from the revival of the billet agreement, with a price basis somewhat below that recently prevalent, but the spread between billets and rods would seem sufficient to encourage some buying by rod mills. That steel mills which have had no steel to sell for months are now able to offer a certain small fraction of their output on the market indicates that finishing capacity is not as fully occupied as it might be, even after the shut downs of the first half of July. While there are no indications thus far that consumption is to be materially reduced in the near future, yet the effect of the Wall Street crash, or rather of the causes that led to it, upon the business interests of the country is being seriously discussed. Over-extension of credit on industrial operations is apt to be followed by the same sharp scrutiny and sifting as has come to the stocks of over-capitalized consolidations. The railroads, while not scrambling for early places on the order books of the rail mills, keep on contracting for next year and it is estimated that close to 1,000,000 tons for 1904 delivery is now booked, including what was originally placed for 1903 that must go over. The investigations by the granger roads into the probable yield in the wheat and corn States have brought them to the conclusion that every car will be needed to meet the demands of the fall and winter. Pig iron is weaker. Stocks have been increasing while foundrymen have waited, and the large buyers of foundry iron assert that $12 Southern iron is within sight, though reports of a large block being taken at that figure are again denied. Contracts for castings are being taken with every week, for which the pig iron is yet to be bought. Importations, presumably under old contracts, have been more of a factor than has been generally supposed, being 79,000 tons for June and 882,000 tons for the year ending June 30, or equal to the output of 12 foundry iron furnaces each producing 200 tons a day. If imports cease and the scattered furnaces that find the present market price close to their cost line close down there should be no marked disparity between production and consumption for some time. While 32 blast furnaces are building, the bulk of their output will go into steel, so that foundry iron does not promise to be seriously overdone. The selection of Judge Gray as the fifth arbitrator in the Alabama coal strike means the early resumption of mining if he accepts, as is expected. Bessemer iron is a shade lower, but merchant furnaces in the Central West have refused to go below $18 at furnace on a 20,000-ton lot; the buyer's offer was 25 cents less, or $18.60 Pittsburg. No doubt much structural work has been lost, for a year at least, by strikes, and the call for steel for new manufacturing plants has slackened considerably. Yet railroad work is still promising. The New York Central has plans that will call for 20,000 tons. Canadian railroads have work projected for which 200,000 tons will be needed. Lake shipyards have not as good an outlook for new tonnage as was the case one year ago. Bar mills have less tonnage ahead of them than in many months. Steel seems less active than iron, the cutting on the latter having reversed the position of the two as to prices. Some little stimulus has been given the sheet trade in the past week, but time will be required to show whether the independent mills have really a better footing under the new steel prices. All depends on the price policy of the leading sheet interest.

PITTSBURG.

OFFICE OF *The Iron Trade Review*, 429 PARK BUILDING, July 29.

Buyers are still waiting for the bottom, while producers, anxious to secure business in several lines, are offering slight concessions. A sale of Northern No. 2 foundry iron has been reported at $17.50, Pittsburg, while furnaces outside of the Bessemer association are willing to take $18 at the furnace for their product, and several lots of Valley basic are offered at $18.50, Pittsburg. In finished lines a feature is the report that large buyers of sheets have received a temporary concession on any large orders placed at once, the quotation being subject to withdrawal at any time. Conflicting reports are heard of concessions in the bar iron trade. Sales of about 1,500 tons have been made here this week, one lot of 1,000 tons, carrying railroad specifications, bringing 1.75c, Youngstown, while another of several hundred tons of nut iron was contracted for at 1.70c, Youngstown. Ordinary merchant bar iron is quoted at 1.65c, Pittsburg. It is doubtful if the two large producers of bar iron—the Republic Iron & Steel Co. and the Carnegie Steel Co.—will quote lower on account of the effect on steel bars which are now held by agreement at 1.60c. The steel bar market is exceedingly quiet on account of the waiting attitude of the agricultural implement manufacturers who hope to secure concessions when they place their contracts. There has been further buying of rails for next year's delivery, the railroads evidently looking upon the present condition of trade as only temporary and are proceeding with outlined improvements. Within the past few days Valley furnaces have been asked for prices on two lots of Bessemer iron aggregating 20,000 tons, the one lot to be used in a conversion deal. In both instances $17.75, Valley, was offered, but the furnacemen declined to take the business below $18.

The action of the steel makers in fixing the price of Bessemer billets and slabs at $27, delivered, Pittsburg, Wheeling, Valley, Ashland, Ky., Johnstown, Pa., and Lorain, O., has not resulted in any heavy buying, and the sheet and tin mills are also holding off on sheet and tin bars as they believe prices will not be advanced for some time to come. Both the United States Steel Corporation and the Jones & Laughlin Steel Co. have a fair tonnage of steel to offer for immediate delivery, but the Republic Iron & Steel Co. will be out of this market for at least two months on account of the rebuilding of its Bessemer plant at Youngstown, O., while the Lackawanna Steel Co. will have no billets to offer to the trade until the first of the year at the earliest, as its entire production of steel up to that time will be consumed by is rail mill. The Cambria Steel Co. will have little steel to offer, while the Ashland Steel Co.,

although not a member of the pool, must meet such a low Ashland price in the schedule of the pool that there is little inducement for it to offer its surplus billets in the open market. The Wheeling Steel & Iron Co. will continue to offer its usual quota of billets in this market, as it has been one of the most constant sellers of billets. The eight concerns in the pool will sell no steel to middlemen, the line even being drawn on conversion arrangements. This gives the manufacturers an extra grip on the general situation as speculation in steel is thereby entirely eliminated.

Pig Iron.—A majority of the Northern furnaces have ceased making quotations on foundry iron and are waiting for the buying movement to set in before giving prices to consumers. The few furnaces that are offering iron are naming concessions and on a lot of 500 tons of No. 2 for early delivery the price was $17.50, Pittsburg, which is 35 cents below the lowest figure quoted last week. On Bessemer iron the ruling quotation is $18.85, Pittsburg, and two lots aggregating 20,000 tons were refused by the furnacemen at $18.60. Valley basic is quoted at $18.50, Pittsburg, but it is believed on a round tonnage this price could be shaded at least 25 cents a ton. Southern irons are finding no sale in this market and offers of $12, Birmingham, for No. 2 have been turned down by the foundrymen. Until the molders' wage scale for the ensuing year is adjusted in this district there will be no buying, and the strike of the molders started this week in the Youngstown district will still further delay the foundry buying movement in that section. We revise quotations as follows:

Bessemer, Valley	$18 00 to 18 25
Bessemer, Pittsburg	18 85 to 19 10
No. 1 Foundry	18 50 to 18 75
No. 2 Foundry	17 50 to 18 00
Gray Forge, Pittsburg	17 00 to 17 10
Chilled Basic, Valley	17 65 to 18 00
Chilled Basic, Pittsburg	18 50 to 18 85

Steel.—The pool price of $27 on Bessemer billets and slabs up to and including .20 carbon has not resulted in any heavy buying on the part of independents, and while this price should prove attractive to wire mills having their own rod mills, owing to the price of $36 on rods, these concerns have thus far manifested little interest. All quotations according to the terms announced cover delivery at final destination, f. o. b. We make the following quotations: Bessemer billets 4x4 inches and slabs, up to and including .20 carbon, $27, Pittsburg, Wheeling or Valley, Johnstown, Ashland, Ky., Ironton, O., and Lorain, O.; .21 to .60 carbon $1 advance and .61 to 1.00 carbon $2 advance; open-hearth billets up to and including .60 carbon, $28, and over .60 carbon $29; billets smaller than 3⅞-inch and sheet and tin bars are $1 per ton extra; Bessemer rods, $35.50 to $36 and open-hearth are held at $1 advance.

Ferro-Manganese.—The market is quiet and on the small lots that are being sold concessions are being named carload lots are held at $49 per ton and smaller lots at $50, delivered at buyer's mill.

Spelter.—There has been no change in prices during the week and there is little buying. Quotations for spot carload lots are 5.63½c to 5.65c, Pittsburg.

Muck Bar.—Eastern muck iron is being offered in this market at $30, but the mills in this district are making no effort to meet this price, and there is little doing.

Skelp.—There is practically no demand for either iron or steel skelp and the former is quoted nominally at 1.85c for grooved and 1.95c for sheared. Steel skelp is quoted at 1.80c to 1.85c.

Rails and Track Material.—A number of contracts for standard sections for 1904 delivery were closed during the week and the new rail tonnage booked thus far for next year's delivery together with business carried over is rapidly nearing the 1,000,000 mark. The demand for light rails continue fair. We make the following quotations: Standard sections, 50 pounds and over, in lots of 500 tons and over, $28; car lots and less than 500 tons, $30; less than car lots, $32; light rails, 8 pounds, in carload lots, $39; less than carload lots, $40; 12 pounds, $33.50; 16 and 20 pounds, $33.00 to $32.25; 25 to 40 pounds, $32.00 to $32.50. Track material: Spikes, 2.15c to 2.20c; track bolts, square heads, 2.05c; hexagon heads, 2.65c; fish plates, 1.60c on orders accompanying large rails contracts, otherwise 2c to 2.10c is asked.

Bars.—We note the sale of one lot of 1,000 tons of iron bars for delivery during the next three months at 1.75c, Youngstown, railroad specifications covering the product. Another sale of 500 tons of nut iron was made at 1.70c, Youngstown. Both command somewhat higher prices than common iron bars which are held at 1.65c, Pittsburg. The buying of steel bars is limited almost entirely to early deliveries and the mills in this district are suffering for want of business. Despite the tremendous capacity of the iron bar mills of the country a number of new projects are already under way and a number of plants are still further increasing their capacity. We make the following quotations: Bessemer steel bars, 1.60c; open-hearth, 1.70c; plow beams and cultivator beams, 1.60c, net; channels, angles, zees and tees, Bessemer, under 3 inches, 1.70c; over 3 inches, 1.80c; bar iron 1.60c to 1.65c, Youngstown, with freight added to point of delivery from Youngstown. The following differentials maintain: Less than 2,000 pounds of a size and not less than 1,000 pounds, 10 cents advance; less than 1,000 pounds of a size, 30 cents advance. Hoops and bands are quoted at 1.90c, full extras, in 250-ton lots and over, and 2c in less than 250-ton lots.

Plates.—Little new business has been closed in plates during the week but the mills while catching up on their orders find sufficient current business to keep them in full operation. Quotations remain unchanged: Tank plates, ¼-inch thick and up to 100 inches in width, 1.60c at mill, Pittsburg; flange and boiler steel, 1.70c; marine, ordinary firebox, A. B. M. A. specifications, 1.80c; still bottom steel, 1.80c; locomotive firebox, not less than 2.10c, and it ranges in price to 3c. Plates more than 100 inches 5c extra 100 pounds. Plate 3-16-inch in thickness, $2 extra; gauges Nos. 7 and 8, $3 extra. These quotations are based on carload lots, with 5c extra a hundred pounds for less than carload lots. Terms, net cash, in 30 days.

Structural Material.—Local mills are now making deliveries on small contracts in from ten days to two weeks and in a number of cases orders that were to be filled in August have already been rolled. Quotations are unchanged as follows: Beams and channels, 3 to 15 inches, 1.60c; 18 to 24 inches, 1.70c; tees, 1.65c; zees, 1.60c; angles from 3 to 16 inches, 1.60c; universal mill plates, 1.60c.

Pipes and Tubes.—All of the mills are comfortably booked ahead on sizes of 4 inches and over while the current demand for merchant pipe is good. We quote as follows in carload lots to consumers, f. o. b. Pittsburg, plus freight according to Tube Rate Book to destination:

MERCHANT PIPE.

	Steel Pipe. Black. Percent.	Steel Pipe. Galv. Percent.	Wrought Iron Pipe. Black. Percent.	Wrought Iron Pipe. Galv. Percent.
⅛, ¼ and ⅜ inch	68	58	65	55
½ inch	70	60	67	57
¾ to 6 inch	75	65	72	62
7 to 12 inch	69	59	66	56
Plugged and Reamed				
1 to 4 inch	73	63	70	60
Cut 3 to 6 feet				
⅛, ¼ and ⅜ inch	63	52	60	49
½ inch	65	54	62	51
¾ to 6 inch	71	60	68	57
7 to 12 inch	65	53	61	50
Cut 6 feet and longer				
⅛, ¼ and ⅜ inch	64	53	61	50
½ inch	66	55	63	52
¾ to 6 inch	72	61	69	58
7 to 12 inch	66	54	62	51
Extra Strong Plain End				
⅛ to 8 inch	67	57	63	53
Threads only	66	56	62	52
Threads and Couplings	65	55	61	51
Double Extra Strong Plain End				
¼ to 8 inch	59	49	55	45
Threads only	58	48	54	44
Threads and Couplings	57	47	53	43

NOTE.—Orders for less than carload will be charged at 12½ percent advance. Extra and Double Extra Strong Cut Lengths, lower random discounts by 10 percent net for 6 feet and longer, and 15 percent net for 3 to 6 feet.

BOILER TUBES.

Steel.

	Percent.
1 to 1¼ inches	45
2¼ to 5 inches	62½
1¾ to 2¼ and 6 to 13 inches	52½

Iron.

	Percent.
1 to 1½ inches	86½
2¼ to 5 inches	45½
1¾ to 2¼ and 6 to 13 inches	85½

CASING.

	S. and S. Percent.
2 to to 3 inches	58
2¼ to 4 inches	60
4¼ to 12½ inches	63

Sheets.—It has been reported that the American Sheet Steel Co. is meeting the prices of independent mills and is quoting 2.70c on 28 gauge, black sheets, and 3.80c for galvanized. Officials of the company, however, deny that any concessions are being made. Ruling quotations on 500-bundle lots and over are as follows: No. 28, 2.70c to 2.75c; No. 27, 2.60 to 2.65c; No. 26, 2.50c to 2.55c; Nos. 22 and 24, 2.40c to 2.45c; Nos. 18 and 20, 2.30 to 2.35c; Nos. 14 and 16, 2.20c to 2.25c; Nos. 10 and 12, 2.10c to 2.15c. Galvanized: No. 16, 2.55c to 2.60c; No. 18, 2.80c to 2.85c; No. 26, 3.30c to 3.35c; No. 27, 3.55c to 3.60c; No. 28, 3.80c to 3.85c; No. 29, 4.30c to 4.35c; No. 30, 4.45c to 4.50c.

Wire and Wire Nails.—With the settlement of many building strikes throughout the country the demand for nails is reported much better and jobbers are fast cleaning up their stocks. We quote as follows: Wire nails, carload lots, to jobbers, f. o. b. cars, Pittsburg, $2; plain wire, carload lots, $1.90; barb wire, carload lots, $2.30; staples, carload lots, $2.20. Galvanizing, 30 cents extra. Carload lots to retailers are held at 5 cents advance in all lines, and on less than carload lots a further advance of 10 cents is charged. Steel cut nails are quoted as follows: Carload lots, $2.15, and less than carload lots, $2.20 f. o. b. Pittsburg, plus freight to point of destination. Iron cut nails are $2.25 in carload lots and $2.30 in less than carload lots. Terms, 60 days, less 2 percent off in 10 days.

Merchant Steel.—The demand for the finer grades of steel is not very heavy and a number of mills are operating at only half their capacity. We quote: Turned cold rolled and ground shafting, 47 off in carload lots and 42 percent off in less than carload lots. Tire steel, 2.15c to 2.25c; spring steel, 2.25c to 2.35c; toe calk, 2.30c to 2.40c. Tool steel is quoted 7 cents and upwards, according to the grade.

Old Material.—Dealers are not buying nor are the steel mills interested in the present market. The foundrymen are also holding off, looking for bottom prices. Concerns having old material to sell are on the other hand asked such prices as will not induce the dealers or mills to buy.

Coke.—Despite the surprising range of prices that is being quoted on both furnace and foundry coke, the coke dealers declare that they continue to secure sufficient business to keep their ovens in operation and to prevent the stocking of their product. It is also asserted in many quarters that the coke producing capacity is entirely too great, but this has not deterred the formation of companies in the past week who have plans outlined for the erection of upwards of 1,000 ovens in the western part of this State, while the Jones & Laughlin Steel Co. will erect an additional battery of 400 ovens in this city. When these additional ovens are placed in operation the coke producing capacity of this district will be still further increased by about 1,000,000 tons annually. Strictly Connellsville furnace coke is held at $2.25 to $2.50, while foundry coke is quoted at $3.25. The quotations on outside coke range from $1.50 to $2 for furnace and from $2 to $2.75 on foundry. For the week ending Saturday, July 18, the production of the upper Connellsville region amounted to 252,819 tons, as compared with 250,262 of the previous week, while the lower region produced 55,560 tons, an increase of about 600 tons over the production of the previous week.

CHICAGO.

OFFICE OF *The Iron Trade Review*,
1115 MONADNOCK BLOCK, July 28.

During the past week the specifications received at Western mills were in excess of the producing capacities of these mills. And in addition there were very fair sales for future shipment. Trade, in short, was somewhat above normal. That this should occur simultaneously with the serious decline in the prices of industrial securities is rather remarkable and probably denotes that the consumptive requirements of the West are increasing. The last half of July has been considerably more active by way of specifications than either the first half of the month or the last half of June. There has been, however, much pessimistic talk and the general attitude of the trade is still to withhold orders and even specifications to the extreme limit of time. It is chiefly that consumers are fearful concerning the stability of prices; were the latter assured, the buying would increase largely. Of the contracts already placed, few if any are for tonnages so large as those bought last year. This does not imply a smaller consumption, for the belief is that some time next winter, in the midst of the season, there will be considerable supplementary buying. In the aggregate the consumption of the metals may be less than in 1902. Some of the Eastern mills are certainly gaining on their orders, but from the individual consumers' standpoint the situation is not indicative of a lessened business for the current year.

Pig Iron.—The modified activity which made its appearance ten days or two weeks ago in foundry irons continues. The market is not dead, as it had been for months previously, but the buying is fairly good in small lots. Southern irons are the more active. The association furnaces are holding to $13.50, Birmingham, for No. 2 foundry and for their Spartan courage are occasionally booking a carload, a hundred-ton order being obtained more rarely still. But for the general run of the current trading, which is anywhere from 50 to 500 or more tons, those Southern furnaces that are cutting the association prices are getting the business. And the general level at which this business is being taken has fallen fractionally, as compared with a week ago. At that time a $13, Birmingham, contract was not rare; today the level generally accepted by the factors that are active in closing business is $12.50, orders ranging from that price as about bottom up to $13, Birmingham. Several contracts of 500 tons each were closed and a more numerous business in lots of 200 to 300 tons. The usual policy of the melters is to buy thirty to sixty days' supply, the former being the more common. These buyers are inclining to the view that they can buy at $12, if they delay a while. Northern irons have declined relatively, but little business is reported. The Western furnaces are generally sold up some weeks ahead and are pursuing a rather negative policy, watching the developments, and biding their time. Quotations are as follows:

Lake Superior charcoal	$21 00 to 21 50
Local Coke Foundry No. 1	18 00 to 18 50
Local Coke Foundry No. 2	17 50 to 18 00
Local Coke Foundry No. 3	17 00 to 17 50
Local Scotch Foundry No. 1	18 00 to 18 50
Southern Coke No. 1	17 35 to 18 35
Southern Coke No. 2	16 85 to 17 85
Southern Coke No. 3	16 35 to 17 35
Southern Coke No. 4	15 85 to 16 85
Southern No. 1 soft	17 35 to 18 35
Southern No. 2 soft	16 85 to 17 85
Southern Gray Forge	15 60 to 16 60
Southern Silveries (4% to 5% silicon)	18 35 to 18 85
Southern Silveries (5% to 6% silicon)	18 85 to 19 35
Jackson Co. Silveries (6% to 8% silicon)	21 30 to 22 30
Jackson Co. Silveries (8% to 10% silicon)	22 30 to 23 30
Ohio Strong Softeners	21 00 to 22 00
Alabama and Georgia Car Wheel	**26 35 to 27 35**
Malleable Bessemer	18 00 to 18 50
Basic iron	17 35 to 18 35

Bars.—A Western railroad company bought 4,000 tons of iron bars for twelve months deliveries and another order was placed for 1,500 tons. There has been a moderate trading in lots of 100 to 200 tons, for shorter deliveries. Prices are without notable change. The generality of orders are placed at from 1.65c to 1.70c, but large and desirable tonnages are said to have brought out some slightly lower quotations. Specifications on steel bars continue to come in in the livelier way noted last week, but buying for future shipment is not large. We quote mill shipments, Chicago delivery: Bessemer steel, 1.76½c; angles, less than 3x3, 1.86½c base; hoops in lots of 250 tons and greater, 2.06½c; less than this amount, 2.16½c; iron, 1.70c to 1.75c. Quotations from store, steel,

2c; iron, 2c to 2.10c; hoops, 2.40c to 2.50c; angles, 2.25c rates.

Sheets.—Slight irregularity continues in the sheet trade, especially for the lighter gauges. The demand is not keen, but is considered fairly good for mid-summer. We quote mill shipments, carload lots, Chicago delivery, as follows: No. 27 black, 2.75c to 2.85c; No. 28, black, 2.85c to 2.95c. Galvanized 75 and 10 to 75 and 10 and 2½ percent. On lots from store, we quote No. 27 black, 2.95c to 3c; No. 28 black, 3.05c to 3.10c. Galvanized, 75 percent to 75 and 2½ percent.

Plates.—While there have been no notable orders for plates this week, the specifications on old orders have shown sharp improvement, consumers who had been withholding specifications taking action, one of the specifications being for 4,000 tons, or rather more than the Western mills produce in a week. We quote mill prices, Chicago delivery, as follows: Tank steel, ¼ inch and heavier, 1.75c; flange steel, 1.85c. Prices for lots from stock: Tank steel, ¼ inch and heavier, 2.15c to 2.25c; 3-16, 2.25c to 2.35c; No. 8, 2.30c to 2.40c; No. 10, 2.35c to 2.45c; flange steel, 2.40c to 2.50c.

Structural Material.—There is discussion concerning the erection of several buildings at Chicago which will involve a large tonnage of shapes, but no contracts have been closed within the past week. Some of the smaller producers report a good demand, but as compared with last year, the store trade especially is showing some decline. Bridge work is remarkably lively and a heavy tonnage is going into that market. We quote mill prices, Chicago delivery: Beams and channels, 16 inches and under, 1.75c; 18 inches and over, 1.85c; universal plates, 1.75c; angles, 3x3 and larger, 1.75c; tees, 3x3 and larger, 1.80c; zees, 1.75c. Lots from store, 2¼c per pound.

Merchant Steel.—Trading in merchant steel is light. Contracts were closed last season earlier than ever known before, and this year a record in the contrary direction promises to be made. However, there is some buying each week and specifications are fairly satisfactory. We quote mill shipments, Chicago delivery, as follows: Spring steel, 2.65c to 2.75c; sleigh shoe, 1.95c flat sizes; concave and convex, 2c; out of store, 2.15c; cutter shoe, 2.50c to 2.60c; machinery steel, 2.15c to 2.25c base; plow steel, 2.50c and upwards, according to quality; toe calk, 2.30c to 2.40c; out of stock, 3c to 3.10c; ordinary tool steel, 6c to 7c; specials, 13c and upwards; less than carload lots, 5 and 10 percent higher; cold rolled shafting, carload lots, 47 percent off; less than carload lots, 42 percent off.

Merchant Pipe.—The aggregate tonnage of merchant pipe placed this past week is in excess of that for the previous week, which was an unusually good showing. Prices are well maintained. We quote carload lots mill shipments, random lengths, f. o. b. Chicago, as follows:

	Steel Pipe.		Guaranteed Wrought Iron Pipe.	
	Black. Percent.	Galv. Percent.	Black. Percent.	Galv. Percent.
⅛ to ¾ in. inclusive	66.35	56.35	63.35	53.35
½ inch	68.35	58.35	65.35	55.35
¾ to 6 inches	73.35	63.35	71.35	61.35
7 to 12 inches, inclusive	67.35	57.35	64.35	54.35

Less than carload lots, 12½ percent advance over above prices.

Boiler Tubes.—Producers are anywhere from six to twelve weeks behind in their orders and the present betrays no lessened activity. Prices are firm. Quotations below are on carload lots, mill shipments, f. o. b. Chicago. On less than carload lots, 12½ percent is to be added:

	L. W. Steel Percent.	C. C. Iron Percent.
1 to 1½ in.	43.35	38.35
1¾ to 2½ in.	55.35	35.35
2¾ to 5 in.	60.35	45.35
6 to 13 in.	55.35	35.35

For lots direct from warehouse stock:

	L. W. Steel Percent.	C. C. Iron Percent.
1 to 1½ in.	40	35
1¾ to 2½ in.	50	32½
2¾ to 5 in.	57½	42½
6 to 13 in.	50	32½

Cast Iron Pipe.—One lot of about 6,000 tons of pipe was placed last week in the East, and among Western sales was one for 800 tons of 6-inch at $31. Colorado is inquiring for a round lot or two, but generally municipal work is not active. Car loads are quoted, f. o. b. Chicago, 4-inch water pipe, $32; 6-inch, $31; 8-inch and upwards, $30; gas pipe, $1 a ton higher.

Rails and Track Supplies.—One order for 20,000 tons for 1904 shipment was placed in the past week and other transactions bring up the total Western trade of the week to about 30,000 tons. There have been a few orders, ranging down from 2,000 tons to small lots for this year's deliveries. Track supplies are selling rapidly for 1904 shipment and at firm prices. We quote standard sections, 500 tons and over, $28; less than 500 tons to carload lots, $30; less than carload lots, $32; second quality rails, $27; rails, 25 to pounds, $32 to $34; 12 pounds, $39 to $40; regular differentials for intermediate sizes. Track supplies, mill shipments: Angle bars, 2c to 2.10c; spikes, first quality, 2.25c (out of store, carload lots, 2.35c to 2.45c rates); second quality, 2.10c; track bolts, 3½x¾ with square nuts, 2.85c to 3c per 100 pounds; with hexagon nuts, 3c to 3.10c, with usual differentials for other sizes.

Billets and Wire Rods.—At the newly established price of $28, Chicago, for Bessemer billets, there have been sold this past week several hundred tons. For forging purposes open-hearth billets have sold at $33 to $38, according to quantity and deliveries.

Wire and Wire Nails.—The retail trade is buying rather slenderly at present but perhaps seasonably well. As compared with last year quotations are strongly maintained. Quotations to jobbers, Chicago delivery, are as follows: Wire nails, carload lots, $2.20; less than carload lots, $2.30. Cut nails, steel, carload lots, $2.26½; less than carload lots, $2.36½. Plain wire, $2.10 carloads, and $2.20 in smaller lots; galvanized, carloads, $2.40; smaller lots, $2.50. Barbed wire, carloads, $2.50; less than carloads, $2.60; galvanized, carloads, $2.80; less than carloads, $2.90; staples, carloads, $2.30; smaller lots, $2.40; galvanized, carloads, $2.60; small lots, $2.70. Bale ties, 82½ and 5 percent discount f. o. b. Waukegan on straight carload lots. Poultry netting, 85 and 5 percent discount from list f. o. b. Joliet or DeKalb, with actual freight allowed not exceeding 50 cents per 100 pounds.

Coke.—A marked difference exists between the quotations for spot and for future shipments, especially for foundry coke. Producers in the Connellsville district are holding firmly to $3.50 oven for contracts, but for July or August shipment will sell readily at $3, ovens. There are few surplus stocks at Chicago, but a few bargains may still be picked up and many consumers are stocking up against an anticipated shortage this coming winter.

Old Material.—The disposition seems to be to let the market alone unless there is actual need. But the wants are not usually pressing and there is little to relieve the market from the appearance of dullness. Where there is change in quotation it is usually downward, though scarcity, temporary or otherwise, brings about a slight turn upward. Dealers' selling prices in gross tons are as follows:

Old iron rails	$20 00 to 21 00
Old steel rails (mixed lengths)	16 50 to 17 00
Old steel rails (long lengths)	19 00 to 20 00
Relaying rails	29 00 to 31 00
Old wheels	19 50 to 20 00
Heavy melting steel	15 50 to 16 50
Mixed country steel	12 50 to 13 50

The following are selling prices per net ton:

No. 1 R. R. wrought	$14 25 to 14 50
No. 2 R. R. wrought	13 75 to 14 25
Shafting	15 50 to 16 50
Dealers' forge No. 1	12 50 to 13 50
No. 1 busheling and wrought pipe	11 50 to 12 00
No. 1 cast	14 00 to 15 00
Heavy cast (300 pounds and over)	10 00 to 10 50
Country malleable	12 50 to 13 00
Iron axles	19 00 to 19 50
Steel axles	17 00 to 17 50
Cast borings	5 50 to 6 00
Mixed borings, etc	5 50 to 6 00
Wrought turnings	10 50 to 11 00
Machine shop turnings	10 50 to 11 00
Iron axle turnings	11 50 to 12 00
Steel axle turnings	11 00 to 11 50
Stove plate and light cast scrap	10 00 to 10 50
Old iron splice bars	16 00 to 17 00

CLEVELAND.

OFFICE OF *The Iron Trade Review*,
1064 ROSE BUILDING, July 29.

The month just closing is not expected to make as good

a showing in shipments of ore as did July, 1902, but it is not believed that the total will be far behind. Deliveries on ore sold are now pretty well advanced, no more sales are being made, and sales agents are wondering when furnaces will come into the market to buy to meet their requirements until next year's season of navigation opens. Many furnaces will need ore, but they are postponing purchasing until it is really necessary to do so, thereby deferring the time when payments will be begun. Dispatch at some of the Lake Erie docks has been very slow for a week and consequently there is a scarcity of vessels at the head of the lakes, but there has been no change in freight rates, which are firm at 80 cents from the head of the lakes, 72½ cents from Marquette and 60 cents from Escanaba.

Pig Iron.—Reports are rather contradictory, some sellers saying that they are unable to see any change, while others report a decided increase in inquiries and a larger number of sales for early delivery. There is, however, no buying except for immediate requirements. Southern Ohio furnaces are selling No. 2 foundry at $16 at the furnace, or $17.45, Cleveland, while Southern is being sold by independent furnaces at $12.50 Birmingham, or $16.85 Cleveland for No. 2. Association furnaces are taking no orders at announced prices. We quote, f. o. b. Cleveland, with the exception of gray forge, which is quoted at Valley furnace:

Bessemer	$18 35 to 18 60
No. 1 Strong Foundry	18 35 to 18 85
No. 2 Strong Foundry	17 50 to 18 00
No. 3 Foundry	17 00 to 17 25
Scotch No. 1	19 00 to 19 50
Scotch No. 2	18 25 to 18 50
Gray Forge, Valley furnace	17 50 to 18 00
Lake Superior charcoal	23 00 to 23 50

Coke.—Deliveries have improved, but prices have not changed, strict Connellsville foundry selling at $3.25 to $3.50.

Finished Material.—Mills have started in the valley this week, but will be compelled to work largely on old orders for some time, as there is very little new business. Bar iron is still weak, with limited sales at about 1.60c, Cleveland. The price of steel remains at 1.60c for Bessemer and 1.70c for open-hearth, Pittsburg, and the demand is better than for iron. Out of stock steel and iron command the same price, 1.90c for ordinary business. Orders for light sheets are coming in freely, but mills are about up to their orders on heavy lines. The prices of the principal producer through jobbers continue as follows: Galvanized sheets, mill sales, carload lots, Nos. 10 and 11, 2.60c; Nos. 12-14, 2.70c; Nos. 18 to 21, 3c; Nos. 22 to 24, 3.20c; Nos. 25 and 26, 3.55c; No. 27, 3.80c; No. 28, 4.05c; No. 29, 4.45c; No. 30, 4.95c. Galvanized sheets out of stock are quoted 75 and 5 off. For 3-16-inch black sheets and heavier we quote 2.15c. Cleveland. Mill sales of black sheets to consumers are made on the following basis: No. 24, 2.65c to 2.75c; No. 26, 2.75c to 2.85c; No. 27, 2.85c to 2.95c. The following are prices out of stock: No. 10, 2.35c to 2.50c; No. 12, 2.45c to 2.60c; No. 14, 2.50c to 2.60c; No. 16, 2.60c to 2.70c; Nos. 18-20, 2.75c to 2.85c; Nos. 22-24, 2.85c to 2.95c; Nos. 25-26, 2.95c to 3.05c; No. 27, 3.05c to 3.15c; No. 28, 3.15c to 3.25c.

Old Material.—There is no improvement in demand. Mills now resuming are depending on deliveries on old contracts, but they will soon find it necessary to come into the market. We quote as follows, f. o. b. Cleveland, all gross tons:

Old iron rails	$19 00 to 20 00
Old steel rails (over 6 feet)	18 00 to 19 00
Old steel rails (6 feet and under)	17 00 to 18 00
Old car wheels	17 00 to 18 00
No. 1 R. R. wrought	15 00 to 16 00
Mill scrap	14 00 to 15 00
No. 1 machine cast scrap	14 50 to 15 00
Iron axles	22 00 to 23 00
Steel axles	22 00 to 23 00
Axle turnings	14 00 to 15 00
Wrought turnings (free from cast)	13 00 to 14 00
Cast borings	7 00 to 8 00
Uncut wrought iron boilers	9 00 to 10 00
Steel boiler plates	14 00 to 15 00
Grate bars	10 00 to 12 00
Pipes and flues (clean)	14 00 to 16 00
Tank iron	14 00 to 16 00
Hoop and band iron	10 00 to 12 00
Sheet iron	8 00 to 9 00
Wrought drillings	12 00 to 13 00
Malleable iron (railroad)	18 00 to 19 00
Malleable iron (agricultural)	15 00 to 15 50
Stove plate	11 00 to 12 00
Heavy steel	17 00 to 18 00

CINCINNATI.

July 28.

The coke situation is still quiet and easy. The asking price is $3.25, but $3 per ton f. o. b. ovens can be done without much difficulty.

Pig Iron.—The situation is not changed and the market continues in a weak and drooping condition. There has been some improvement in the demand, but the increasing inquiry has resulted in sharp competition for the orders resulting in lower prices. For No. 2 foundry $12.50, Birmingham, is now an open quotation, and there are some who do not hesitate to assert the belief that on any desirable business $12 can be done. It is not stated that the latter figure has been named, but we mention the $12 price in order to present one current view of the market. A large pipe manufacturer was testing the market this week, and it is reported that a purchase aggregating 3,000 tons was made at the following prices, Birmingham basis: No. 2 soft, $12.50; No. 3 foundry, $12; No. 4 foundry, $11.50; graw forge, $11. In Ohio irons there has been no change and quotations ranging from $15.60 to $16 at furnace are the ruling figures. There are rumors of the associated furnaces avoiding their agreement, but there is nothing tangible presented in this line. No very large business is under consideration and buyers are still covering only current needs. The market is more unsettled now than for some time. Nothing that transpires seems to surprise anybody. All sorts of statements are being made by buyers and each sales agent is pursuing his own policy without reference to what others are credited with doing except the agents for the associated furnaces, who are quoting the schedule without results. We quote for delivery f. o. b. Cincinnati:

Southern Foundry No. 1	$16 00 to 16 25
Southern Foundry No. 2	15 50 to 15 75
Southern Foundry No. 3	15 00 to 15 25
Southern Foundry No. 4	14 50 to 14 75
Southern Foundry No. 1 soft	16 00 to 16 25
Southern Foundry No. 2 soft	15 50 to 15 75
Gray forge	14 25 to 14 75
Northern Foundry No. 1	17 65 to 18 15
Northern Foundry No. 2	16 65 to 17 15
Southern car wheel iron	26 25 to 27 25

Finished Material.—The market shows no change so far as prices are concerned, but there is a feeling of conservatism among the trade and the volume of business for July is hardly as large as for June. There is no disposition to purchase for future wants, and it is believed that the unsettled conditions in the Eastern securities market is having at least a temporary effect on the trade. The jobbing demand for structural shapes continues good. In bar iron 1.70c base can be done on any large business offering, but the ruling quotation on carload lots is 1.73c base, the same as for steel. Iron bars, car lots, are quoted at 1.73c to 1.75c base, half extras. Steel bars remain at 1.73c base, half extras, with the retail price 2c base, half extras, for both out of store. Galvanized sheets are being quoted at 75 and 5 percent off. We quote black sheets No. 27 at 2.78c in car lots of 500 bundles. Black sheets out of store are selling as follows: No. 28, 3.10c; No. 27, 3.20c; No. 16, 2.65c; No. 14, 2.55c; No. 12, 2.45c; No. 10, 2.35c. Tank plates are firm and sell out of store at 2.15c for ¼-inch and 2.25c for a 3-16-inch. Beams and channels are quoted at 2.15c to 2.25c from stock, and angles at 2.15c and 2.25c for base sizes. The merchant pipe market is fairly active and steady, but independent mills are said to be looking for desirable business on some sizes at prices slightly below the schedule. This has resulted in no disturbance of the market in general, however, and prices as a rule are well maintained. In boiler tubes there is an easy feeling and buyers are holding off in expectation of a lower schedule of prices, but as yet there is no intimation from the leading interest of any proposed change.

MERCHANT PIPE.

(Basing Discounts.)

	Steel Pipe.		Guaranteed Wrought Iron Pipe.	
	Black. Percent.	Galv. Percent.	Black. Percent.	Galv. Percent.
⅛, ¼, ⅜ inch	66.7	56.7	68.7	58.7
½ inch	68.7	58.7	65.7	55.7
⅝ to 6 inch, inclusive	73.7	63.7	70.7	60.7
7 to 12 inch, inclusive	67.7	57.7	64.7	54.7

BOILER TUBES.

	Steel Percent.	Iron Percent.
1 to 1½ inch	41.2	35.2
1¼ to 2½ inch	54.2	34.2
2¾ to 5 inch	59.7	44.2
6 to 13 inch	54.2	34.2

Old Material.—The market continues weak and dull. It is difficult to locate values. Melters are not buying and dealers hesitate to make purchases owing to the uncertainty of conditions.

Old No. 1 railroad wrought, net tons	$14 00 to 15 00
Cast machine and foundry, net tons	12 00 to 13 00
Old iron rails, gross tons	19 00 to 20 00
Old steel rails, gross tons	17 00 to 18 00
Old short lengths, gross tons	14 50 to 15 50
Old iron axles, net tons	20 00 to 21 00
Stove plate, net tons	9 00 to 10 00
Wrought turnings, net tons	11 00 to 12 00
Cast borings, net tons	6 00 to 7 00

Thomas A. Mack & Co. will remove their offices at Cincinnati from their present location in the Neave Building to the top floor of the new Traction Building on Sept. 1. This gives them a central location.

PHILADELPHIA.

July 28.

Buyers are still determined not to take large lots and it has been found that lowering quotations does not have marked effect. Large buyers of pig iron are apparently waiting for prices to settle, but there is not much prospect of a decided change.

Pig Iron.—There is no settled market. Small lots are disposed of at last week's prices. Stocks in hand are so reduced that frequent buying for prompt delivery is necessary. For favorite brands, $18 to $18.25 is paid for No. 2 X foundry, but $17.75 to $18 is also named for good iron. Quotations are about as follows: No. 2 X foundry, $17.75 to $18.25; No. 2 plain, $17 to $17.50; gray forge standard, $17 to $17.50; ordinary gray forge, $16.25 to $16.50; basic, $17.25 to $17.50.

Steel.—The renewal of the billet pool is not of as great importance as its creation in 1900 for the reason that a majority of the former large buyers are now making their own steel. Bessemer billets are now offered at $28.25 and open-hearth at $29.

Finished Material.—There is more inquiry and prospects seem to be better, but buying has not improved. Work held up on account of labor troubles is being resumed and consumption is expected to increase. Specifications are coming in freely. Prices show little change. Orders at inside figures are readily accepted for desirable business. We quote as follows: Plates in small lots, 1.90c to 1.95c; carload lots, ¼-inch and thicker, 1.75c to 1.80c; universals, 1.80c; flange, 2c; marine, 2.10c to 2.15c; fire box, 2.20c to 2.25c. Bars in carloads are usually quoted at from 1.65c to 1.70c for refined iron and 1.70c to 1.75c for steel bars. Beams, angles and channels, ordinary sizes, are quoted 1.73½c to 1.80c for carload lots, with the usual addition for smaller quantities.

Old Material.—Demand is slightly improved. We quote: Old steel rails, $19 to $19.50; miscellaneous heavy steel scrap, $18.50 to $19; low phosphorus scrap, $26 to $27; old steel axles, $21.50 to $22.50; old iron axles, nominal, $24 to $25; old iron rails, nominal, $21.50 to $22; old car wheels, nominal $21.50 to $22; choice scrap railroad No. 1 wrought, $18.50 to $19; country scrap, $17 to $17.50; machinery cast, $17 to $17.50; No. 2 light scrap, forge, $17 to $18; No. 2 light scrap, ordinary, $13 to $14; wrought turnings, $14 to $14.50; wrought turnings, choice heavy, $15 to $15.50; cast borings, $9 to $9.50; stove plate, $12.50 to $13.

NEW YORK.

OFFICE OF *The Iron Trade Review*,
ROOM 1909, NO. 150 NASSAU ST., July 28.

Pig Iron.—The market is in an unsettled condition, with intermittent activity and iron being taken in small quantities, indicating that buyers are only purchasing as their immediate needs necessitate. Accurate quotations are difficult to obtain, because wherever a probable buyer makes his wants known, there the sales agents gather, each of them, it would seem, willing to shade the other's price to get the order. Competition could scarcely be keener. Reports from many centers tell of foundrymen booking new orders for castings but in no hurry to contract for the iron to execute them. One sales agent tells of a New England foundryman who took an order during the week that will require 1,000 tons of pig iron, but who believes he will gain by waiting several weeks before buying his iron. Other like reports indicate that the believers in lower prices are as numerous as they ever were. This is particularly true of Southern irons. We quote New York prices as follows: Northern No. 1 X, $18.25 to $18.75; No. 2 X, $17.75 to $18; No. 2 plain, $17.25 to $17.50; Southern No. 1 foundry, $17.75 to $18.25; No. 2 foundry, $17.25 to $17.50; No. 3 foundry, $16.75 to $17; No. 4 foundry, $16.25 to $16.50.

Rails.—Current trade is of good proportions, and little credence is given reports that the situation in Wall Street will probably lead to the curtailment of demand from railroad sources for next year. Inquiries indicating some good orders later on keep up well. Standard sections continue to be quoted $28 at mill.

Finished Iron and Steel.—The structural market on the whole is quiet with a tendency to go a little slower in ordering material, especially in connection with some large propositions. The upheaval in Wall Street and the condition of the money market are said to be the cause. There is some excellent business in sight, and on good authority we learn that Canadian railroad interests are perfecting plans that will call for some 200,000 tons. Improvements planned by the New York Central Railroad will require at least 20,000 tons. Labor conditions, while improving, still constitute a menace. The situation in bars is a peculiar one, and reports of mills selling at concessions are heard. A weak undertone can be noted. Plates are a little steadier, but new business is on the moderate lot order. Sheets are not as active as might be expected and there are reports of slight concessions on both black and galvanized, particularly on the latter. New York prices are as follows: Beams and channels, 15 inches and under, 1.75c to 1.90c; angles, 3 to 6 inches, 1.75c to 1.90c; zees, 1.75c to 1.90c; bulb angles, 2.05c to 2.35c; deck beams, 2.05c to 2.25c; sheared steel plates, tank, 1.80c to 2c; flange, 2.00c to 2.10c; firebox, 2.25c to 2.30c; refined iron bars, 1.75c to 1.80c; soft steel bars, 1.70c to 1.75c; steel sheets, in car loads, New York, No. 28, black, 2.90c to 3.05c; galvanized, 75 and 2½ off.

The Metal Market.

NEW YORK.

OFFICE OF *The Iron Trade Review*,
ROOM 1909, NO. 150 NASSAU ST., July 28.

Pig Tin.—After remaining quiet, with prices ruling about the same as at our last report, the market became strong and active today, on the statement that stocks are getting smaller. Bullish interests took hold of the situation, and prices at this writing are about 1 cent higher than when we last quoted them. Business conditions remain unchanged, however. The London market during the week, after being weak, closed today at the highest prices. Closings today at the Metal Exchange were as follows: Spot and July, 28.40c to 28.50c; August, 27.75c to 28c. London closed today as follows: Spot, £125 10s 6d; futures, £122 10s. Arrivals at Atlantic ports for the month to date aggregate 1,630 tons, with 2,235 tons afloat.

Copper.—Further reductions in both "official" and open market prices occurred during the week, with buyers more indifferent to developments than they have ever been. The absence of any statistics as to production or consumption, with which the trade was once favored, excites the distrust of buyers, but who, taking exports as a criterion, think that the metal is in a more depressed condition than surface appearances indicate. In some quarters 12c copper is thought possible. At any rate buyers think present prices too high. Under manipulation the London market acted independently, and prices have advanced

nearly £2, for which brokers here see no valid reason. The Metal Exchange closing prices today were nominally as follows: Lake and electrolytic, 13¼c; casting, 12¾c. London closed today as follows: Spot, £55 7s 6d; futures, £55 12s 6d. Exports for the month to date amount to 5,990 tons against 8,834 tons afloat.

Lead.—Spot supplies continue scarce, and command 4.30c to 4.40c. St. Louis is stronger at 4.22½c. London is weaker at £11 6s 3d.

Spelter.—Is quiet and unchanged at 5⅞c. St. Louis is a shade higher at 5.55c. London slightly lower at £20 2s 6d.

Antimony.—Cookson's is 7½c, Hallett's 6½c, and outside brands, 6¼c.

Quicksilver.—Still quoted at $47.50 per flask of 76½ pounds in lots of 100 flasks. London unchanged at £8 2s 6d.

Nickel.—Is selling at 40c to 47c for large lots down to a ton; and 50c to 60c for smaller quantities.

CHICAGO.

OFFICE OF *The Iron Trade Review*,
1115 MONADNOCK BLOCK, July 28.

The copper market keeps all factors guessing. There is a steady decline, though just why no one is sure he knows. The consumption of copper in the West is not so large as it was six months ago, for which comparative quiet there is the usual seasonal cause, and accordingly ordering is not especially active, the buyers being impelled moreover to purchase cautionally on account of the continued recession in values. In carload lots Lake has sold at 13¼c and Casting at 13c to 13⅛c. Lead is $3 per ton higher. Old metals are shrinking in value in sympathy with copper. Pig tin is quoted 29c; pig lead, 4.25c in 50 to 100-ton lots, and 5c to 5¼c in lesser quantities; spelter, 5½c in carload lots, and 6c to 6¼c in lesser quantities; sheet zinc, 6¼c; antimony, 10¾c to 11c for Cookson's, and 9¾c for Hallet's. We quote old metals as follows: Copper wire, 11¼c; heavy copper, 11¼c; light copper, 10¼c; heavy red brass, 11½c; light brass, 10¼c; red turnings, 9¼c; yellow turnings, 7¼c.

Thirty-two Blast Furnaces Building.

The *Bulletin* of the American Iron & Steel Association, in summarizing the situation as to new blast furnace capacity now under erection in the United States, has the following which is of peculiar significance under present conditions in the iron trade:

"On June 30 there were 32 blast furnaces in course of erection in the United States, of which 30 will use coke for fuel when completed and 2 will use anthracite coal and coke mixed. These furnaces are located in the following States: New York, 6 coke; New Jersey, 1 anthracite and coke; Pennsylvania, 1, of which 1 in the Lehigh Valley will use anthracite and coke, and 2 in Allegheny County, 3 in the Shenango Valley, and 4 in other counties in western Pennsylvania will use coke exclusively; Virginia, 1 coke; Alabama, 6 coke; Ohio, 5 coke, 1 at Youngstown, 2 at Lorain, 1 at Cleveland, and 1 at Steubenville; Illinois, 1 coke; Michigan, 1 coke; and Colorado, 1 coke. About one-half of these furnaces will be completed and blown in before the close of 1903, but the remainder will not be ready for blast until 1904 or 1905. In addition to the new furnaces enumerated above, one coke furnace in Virginia, upon which work was suspended several years ago, is to be completed in the near future and several coke furnaces are projected. No new charcoal furnaces were being built on June 30, but several charcoal furnaces which had been idle for a long time were about to be revived."

The holders in Jones & Laughlin, Ltd., of Pittsburg, will hold a meeting on Thursday, July 30, for the purpose of voting on the proposition to prolong the partnership for another period of 20 years. Action will be taken continuing the partnership in order to hold any rights and privileges which belong to it. The firm and the various other affiliated interests were merged into the Jones & Laughlin Steel Co. about a year ago.

IRON AND STEEL PRODUCTION IN PENNSYLVANIA.

Comparative figures for 1896 and 1902 have been made public in advance sheets of the report of the Bureau of Industrial Statistics of 771 industrial establishments of the State of Pennsylvania. In 1896 these 771 establishments employed 129,240 people. There has been a continual increase in employment during the seven years covered in these tables, until, in 1902, 293,297 persons were employed, a gain of 57.8 percent. So it is with the wages paid. From $49,430,808 paid in 1896, the wages have continually increased until in 1902, $98,432,570 was paid to working people. The market value of the production of these establishments in 1896 was $185,249,628, as against $421,141,115 in 1902, a gain of 127.3 percent.

The report has this to say of the steel industry: "The production of steel in the State has kept pace with the times and added great wealth to Pennsylvania, having to its credit the production in 1902 of 8,511,195 gross tons of steel, as against a production in 1896 of 3,345,529 gross tons, a gain of 154.4 percent. The tonnage is made up as follows: Bessemer 4,208,354 gross tons; open-hearth basic and acid 4,220,279 gross tons, and crucible and other processes, 82,562 gross tons. The capital invested in plants producing a rolled product in 1896 was $123,951,317, which has increased to $247,870,718 in 1902, a gain of 99.9 percent. The total amount of wages paid to the workingmen employed, exclusive of office help and salaried men, was $60,721,858, in 1902, as against $53,334,787 in 1901, making a gain of 13.8 percent. The total of wages paid out in 1896 was $23,832,628, which shows, by the above comparison, that the rolling mills paid for labor in 1902 $36,889,230 more than in 1896, or a gain of 154.8 percent."

Of the advance in the production of tin plate, the report says: "The statistics show a capital invested for 1896 of $3,627,275, while in 1902 there was $10,858,403 invested capital, or an increase of 190.4 percent. The production has increased from 158,306,490 pounds in 1896 to 428,443,592 pounds in 1902, an increase of 270,137,102 pounds, or 170.6 percent. The value of tin plate manufactured in 1902 has increased $11,478,944 over the value of 1896, a gain of 247.5 percent. In 1896 Pennsylvania produced 4,026,350 gross tons of pig iron, and there has been a rapid increase in production in the seven years, with the exception of 1900, when there was a slight decrease, until in this year's report the total is 8,111,642 gross tons, a gain of 101.4 percent.

Another Appeal for the Consolidated Lake Superior Co.

President Shields of the Consolidated Lake Superior Co. has made another appeal to the stockholders of the company for financial assistance. In a circular letter sent to the stockholders he announces that unless the proposed $12,500,000 bond issue is taken the whole property must pass into the hands of the creditors. The creditors are New York and Philadelphia banks, headed by Speyer & Co., of the former city, who hold all available collateral security of the company for three loans amounting to $5,050,000. The Lake Superior Co. is capitalized at $102,000,000, of which $70,000,000 is held in Philadelphia. President Shields, in his appeal, says: "The Consolidated Lake Superior Co. is in a critical condition from which it can be rescued only by the prompt and decisive action on the part of the stockholders. By means of the issue of $12,500,000 of thirty-year 4 percent bonds there must be provided the full amount of $7,500,000 with which to take care of the temporary loans of $5,050,000 and about $1,500,000 of current debts. Unless this entire sum can be provided in some way the whole property must pass into the hands of the creditors, and forced liquidation, with all of the works idle and unproductive, is sure to result in the sacrifice of a great part of the investment. On the other hand, if the $7,500,000 can be provided the company will be free of its floating indebtedness, with working capital sufficient to carry on its business, and in a position to earn double the amount of its fixed charges."

George S. Griscom, Jr., formerly sales agent in the Pittsburg district for Hickman, Williams & Co., has severed connections with that concern and is now representing the Princess, Roanoke and Juniata furnaces, with temporary offices at 406 German National Bank Building, Pittsburg.

THE IRON TRADE REVIEW

Devoted to the Machinery, Metal-Working and Foundry Trades, and Iron and Steel Manufacture.

PUBLISHED EVERY THURSDAY BY

THE IRON & STEEL PRESS CO.

ROSE BUILDING, CLEVELAND, OHIO.

G. H. GARDNER, President and Treasurer,
JOHN A. PENTON, Vice-President,
A. I. FINDLEY, Secretary.

A. I. FINDLEY, - - - - - - - EDITOR.
ROBERT I. CLEGG, - - EDITOR MACHINERY DEPARTMENT.
GEORGE SMART, - - - - - ASSOCIATE EDITOR.

CHICAGO: 1115 Monadnock Block, GEO. H. GRIFFITHS, Manager.
PITTSBURG: 429 Park Building, A. O. BACKERT, Manager.
NEW YORK: 150 Nassau St., D. C. WARREN, Manager.
THE CENTRAL WEST: R. A. EVANS, Manager.

Subscription, $3.00 per annum. To Foreign Countries, $4.00.
Advertising Rates Furnished on Application.

The Cleveland News Co. will supply the trade with THE IRON TRADE REVIEW through the regular channels of the American News Co.

ENTERED AT THE POST OFFICE AT CLEVELAND, O., AS SECOND CLASS MATTER.

JULY 30, 1903

REVIVAL OF THE STEEL BILLET AGREEMENT.

The recent announcement of pool prices by the steel billet association is the first attempt on the part of that organization to regulate the steel market since November, 1900. For a period of two years and eight months the market has taken care of itself, and while official prices remained at $19.75 for 4x4 billets, delivered, Pittsburg, Wheeling or Valley until the recent action, sales were made one year ago at $35 per ton at the mill in the Pittsburg district. Throughout this period of prosperity in the iron and steel trade there was no need of official action by the association, but the downward tendency of the market in the past three months resulted in the fixing of prices at a point somewhat below ruling quotations, with the purpose of inducing prospective buyers to cover their requirements. The highest prices paid for billets in recent years were recorded in 1899, when small lots sold at $39, Pittsburg. From that time the market declined steadily and one year later sales were made at $17.50, Pittsburg, showing a falling off in price in a twelvemonth period of $21.50 per ton. On export steel a still lower price than $17.50 was made. Two months later the billet association established a minimum, and prices continued to advance from that time until $35 was reached in June of last year.

Since the association's official action in 1900 there have been momentous changes in the iron and steel industry, and while the tonnage to be disposed of in the open market at that time amounted to several millions of tons, the recent action will not affect more than several hundred thousand. The absorption of the Federal Steel Co., National Steel Co. and Carnegie Steel Co. by the United States Steel Corporation wiped out the chief factors in the steel billet trade until today the pool covers only the surplus of the corporation, and a number of other large steel producers who temporarily are experiencing a falling off in the demand for their finished product, and are willing to dispose of their surplus steel in the form of billets, slabs, sheet or tin bars.

While the association is now composed of eight of the largest steel producers in the country east of the Mississippi, only six of them will have any steel to offer to the trade during the next three to six months. The Republic Iron & Steel Co. is making repairs to its Bessemer plant at Youngstown, O., which will be out of commission until September or October, and while a large stock of steel is in the yards of the company to cover this contingency, it is probable that before many weeks this concern will be a buyer rather than a seller of billets. Nor will the Lackawanna Steel Co. be in position to offer any billets to the trade before the first of the year, as all the steel that can be made after the company's Bessemer plant is placed in operation will be rolled into rails, October 1 being the date set for the starting of the rail mill.

On the demand for finished steel will depend entirely the tonnage of billets and sheet bars to be offered in the open market by the members of the association, all of whom own large finishing plants or have affiliated concerns taking almost their entire output of steel. Should an active market for finished material develop with the fall months the agreement will be subjected to little strain. Its principal practical outcome will be to make it still difficult for the smaller finishing mills, with no steel supply of their own to maintain profitable operations unless prices of finished material should be held as at present. Since the opening of the year three important steel plants have come under the control of the United States Steel Corporation—a fact that seems not to have been given its due weight in some estimates of the immediate future of the steel market. The revival of the billet pool is a further strengthening influence, preventing the effect of any decrease in consumption from passing to the stage of demoralization. The very fact of its revival points to a recognition of a change in the situation, and a desire to avert the condition which brought so large a tonnage of low priced orders upon the books of the National Steel Co. and its competitors in the slump of 1900.

OUR FOREIGN IRON TRADE FOR THE FISCAL YEAR.

Statistics just at hand show the extent of the import and export trade of the United States in iron and steel in the fiscal year ending June 30, 1903. We have opportunity now to give only the salient features. The imports of pig iron in June were larger than expected —79,874 tons, against 57,139 tons in May. The imports of steel billets, etc., in June were 30,503 tons, against 26,389 tons in May. For the 12 months ending June 30 the imports of pig iron were 882,303 tons, and those of steel, 332,030 tons.

The value of iron and steel and manufactures thereof imported by the United States in the fiscal year was $51,617,312, against $27,180,247 for the fiscal year 1902 and $17,874,789 for the fiscal year 1901. The total value of our iron and steel exports in the fiscal year was $96,642,467, against $98,552,562 for the fiscal year 1902 and $117,319,320 for the fiscal year 1901.

NEW RECORDS IN PIG IRON PRODUCTION.

The statistics given elsewhere in this issue, showing 9,707,367 tons of pig iron produced in the United States in the first six months of this year, take on new significance when it is stated that this is more pig iron

than was produced in the entire year 1895, or in the year 1896, or in the year 1897. For these years the output was 9,446,308, 8,623,127 and 9,652,680 tons respectively. The production in the first half of 1903 is at the rate of 19,414,734 tons a year, as against 17,821,307 tons in 1902 and 15,878,354 tons in 1901. That even a greater record can be made in the near future may be inferred from the fact that 32 blast furnaces, most of them of large capacity, are now under construction in the United States. The increase in production in the first half of this year over the second half of 1902 has been nearly 700,000 tons, and all kinds of iron have shared in the increase. The following figures indicate the distribution among steel making and foundry and mill irons in the past three half-year periods:

	First Half 1902. Tons.	Second Half 1902. Tons.	First Half 1903. Tons.
Bessemer	5,105,932	5,287,236	5,480,619
Basic	1,053,274	985,316	1,203,803
Foundry and Forge	2,649,368	2,740,181	3,022,945
	8,808,574	9,012,733	9,707,367

When it is stated that in the entire year 1901 the production of basic pig iron was 1,448,850 tons, or but 245,000 tons more than in the first six months of this year, it will be seen how rapidly the production of basic open-hearth steel has advanced in the United States. One year ago, reckoning from the pig iron figures, we calculated that the production of steel in the United States was at a rate of about 15,000,000 tons. For the year 1902 the actual figures showed 14,947,250 tons of steel ingots. We are now producing steel at a rate in excess of 16,000,000 tons.

FREEDOM OF WORKINGMEN.

Two recent utterances in support of freedom of labor are noteworthy. In reinstating W. A. Miller, an employe of the bureau of printing and engraving, who had been discharged in consequence of notice served upon the public printer that the bookbinders' union had expelled Miller, President Roosevelt declared that, while the Government had no objection to its employes organizing themselves into associations, it would not require its employes to belong to any union; in other words, the men are free to do as they please in this matter. This certainly is the right position for the Government to take and the emphatic declaration by the President will generally be accepted as eminently right.

Some developments in the case of Miller serve to accent what has been pointed out repeatedly in these columns concerning the claim put forth by some brands of unionism, of superiority to other authority. The attempt to take control of his shop from the proprietor is only one phase of this spirit of absolutism. The laws of municipality and State have been made time and again to take second place to the decrees of the union. If the union says that work shall cease in a shop until the proprietor yields to its demands, no order of court or of civil or military officers is considered binding that goes counter to the union mandate. Miller's discharge was in direct violation of the civil service laws by which the Government printing office is controlled. His offense was that he had given information calculated to secure greater economy in the operation of the printing office. He had furnished a member of Congress with data showing how certain expenses could be reduced, the service improved and the work done with a smaller force. The union tried him under secret rules, without a hearing, and expelled him. Its impertinent notification to the public printer was equivalent to an order that Miller be discharged and that officer, used to the domination of the union, immediately complied. In defending the stand they had taken—a public declaration that if Miller were reinstated, every union binder would walk out—the officers of the union simply point to instances in which the Civil Service Commission has recognized the union, and claim that in this case the decree of the union that none but union men shall have any place in the public printing office had precedence over any rules of the department or the Civil Service Commission. The President forcibly reminds these persons that "no rules or resolutions of that union can be permitted to override the laws of the United States."

If the right of an American citizen to work, without asking leave of any organization, is not thus practically asserted by the Government whose constitution guarantees him that right, we shall surely look in vain for some sturdy protest against the union tendency to override all that opposes its self-asserted authority. President Roosevelt went the full length in recognizing the rights of unions in his action in the anthracite strike. It is reassuring to see him assert in no uncertain way, following the weak surrender of his public printer, that the man who has employment under the Government is under its laws first of all, and that all other authority comes after.

Governor Durbin, of Indiana, has been quite as emphatic in opposing persecution of men who do not follow the commands of labor agitators. He believes that, if a workingman desires to render his country patriotic service as a member of the National Guard, he should be permitted to do so. Owing to the feeling which has been prevalent in some parts of Indiana that it is a crime for men to assist in suppressing riotous strikes, a number of merchants and manufacturers have discharged men from their employ because they were members of the citizen soldiery. The unions were so aggressive after the recent disgraceful riot at Evansville that several employers discharged men because, as members of the local military body, they had assisted in restoring order and in upholding the law against lynching. Commenting on this action, Governor Durbin said: "To discharge a man from employment because he responded to the call of the State is an act of treason." These words have the right ring, and emphasize the truth, which can not be too frequently affirmed, that Americans are free men and have a perfect right to follow the dictates of their own consciences in joining or refusing to join any organization which has a lawful purpose.

Interest attaches to the experiments the Tennessee Coal, Iron & Railroad Co. has been carrying on at its Ensley, Ala., steel plant in the use of the Bessemer converter as an adjunct of open-hearth furnace operations. The company has had no converters in regular operation, as has been stated, but the experimental work has been conducted in an improvised stationary

converter. Into this 15 tons of molten metal from the blast furnaces at Ensley was charged. The silicon and manganese were oxidized and the carbon reduced to about 1 percent. The semi-converted metal was then charged into the basic open-hearth furnace without scrap and the heat finished in about one-third the time ordinarily consumed with the pig and scrap method. These experiments have been so satisfactory that the company has decided to install at once a modern 16-ton Bessemer converter. The expectation is that the present output of open-hearth steel ingots will be trebled, and the greater portion of it will be rolled direct into rails.

The Pittsburg Railway Supply Co., of Pittsburg, has been incorporated with $1,000,000 capital, half of which will be 7 percent cumulative preferred and the remainder common, for the purpose of manufacturing an anti-friction journal under patents owned by F. G. Ward. Options have been secured on several sites in the Pittsburg district and a large plant is to be built. Officers have been elected as follows: Charles R. Bucheit, president; F. G. Ward, vice president and general manager; M. B. Kelly, treasurer, and J. G. Dunbar, secretary.

The Union Rail Co., organized by A. F. Baumgarten & Bro. with offices in the Farmers' National Bank Building, Pittsburg, Pa., has purchased the plant of the Huntington Tin Plate & Planished Sheet Co., Huntington, W. Va. This plant has been inoperative for some time and the purchasers have decided to remove the two hot mills and the cold mill and install in their place two merchant mills, 10 and 18 inches respectively. A number of scrap heating furnaces are to be built and merchant bar iron and light rails will be rolled.

The annual meeting of the stockholders of the Youngstown Iron Sheet & Tube Co. was held at Youngstown July 28. The following board of directors was elected: Myron C. Wick, George D. Wick, Robert Bentley, H. H. Stambaugh, William Wilkoff, E. L. Ford, C. D. Hine and James A. Campbell, all of Youngstown, and H. G. Dalton, L. H. Severance and James Parmelee, all of Cleveland. The directors will meet within a few days and organize.

"Crane's List" for July, published by A. M. Crane & Co., Chicago, announces the opening of offices in the Arcade Building, Philadelphia, in addition to the offices at Chicago, Pittsburg and New York. The "List" contains 64 pages of detailed information concerning the iron and steel products sold by this company from store and from domestic and foreign mills. Tables of weights and gauges are given to the extent of several pages.

A meeting of the creditors of the Akron Machine Co., Akron, O., was held July 28 and it was decided to continue the business and if possible withdraw from bankruptcy. The company manufactures mowing and reaping machine supplies and it is said that 90 percent of the creditors have consented to a compromise.

The G. L. Bollinger Co., Empire Building, Pittsburg, Pa., has been awarded the contract for the erection of a coaling station at Butler Junction, Pa., by the West Penn Railroad Co. The station will be novel inasmuch as it will be constructed entirely of steel and three engines can be coaled up at the same time. The station will command six tracks. The coal is carried to the locomotive tender in movable bins controlled by a system of levers and automatic drums, doing away entirely with the overhead wooden bins now in use. When the tender is to be coaled the bins are lowered and when emptied they are raised again to a point well above the track, where there is no possible danger of striking a passing engine. This company has also received a contract from the Susquehanna Coal & Coke Co., DuBois, Pa., for a steel cast tipple with an estimated capacity of six tons a minute.

The Labor Situation.

WESTINGHOUSE MACHINISTS' STRIKE.

(Special Telegram.)

PITTSBURG, July 29.—Three hundred of the 800 machinists in the employ of the Westinghouse Machine Co. at East Pittsburg, went on strike this morning on account of the refusal of the company to grant the general advance of 7½ percent conceded the men by the local manufacturers' association three weeks ago. Although numerous strikes have been threatened at this plant in previous years, the company always succeeded in keeping its men at work. It has taken the stand that it will not join in combinations of manufacturers in regard to labor matters and will continue its old policy of making agreements with individual workmen. In a statement issued to the machinists in reply to their demands the company states that it has advanced the wages of 60 percent of its machinists in the past six months and is always willing to listen to any individual workingman's demand for increased pay. In anticipation of this strike the company has been advertising for men during the past two weeks and its officers say that the positions of the strikers will be easily filled. The machinists have also declared strikes at the plants of the Braddock Machine & Mfg. Co., at Braddock, and the Pittsburg Steel Shafting Co., at Rankin, Pa.

ARBITRATION IN THE ALABAMA COAL STRIKE.

(Special Telegram.)

BIRMINGHAM, Ala., July 29.—The four arbitrators already named by the coal miners and operators promptly agreed upon Judge George M. Gray, of the United States Circuit Court of Delaware, as the fifth arbitrator. Charles McCrery, vice president of the Tennessee Coal, Iron & Railroad Co., Robert H. Pearson, William R. Fairley and Edward Flynn, the four members already selected, left for Wilmington, Del., Monday, and are expected to meet Judge Gray today to ask him to act with them. It is believed that he will accept, and if he does work will be resumed at once.

MOLDERS' STRIKE IN YOUNGSTOWN AND VICINITY.

A strike of molders declared on Monday of this week resulted in the shutting down of eight foundries at Youngstown, O., and all at Niles and Girard, O., but one. For the past two months efforts have been made to adjust the molders' wage scale for the ensuing year, but owing to the excessive demands of the men no settlement could be reached. The first demands called for the establishment of a minimum of $3.15 a day of nine hours and an increase of 25 cents a day for molders and coremakers receiving the old minimum or above that rate. Later concessions were made by the molders and their latest demands are for a $3 minimum for molders and $2.75 for coremakers and an advance of 10 cents per day for all molders and coremakers receiving the old minimum and above, nine hours to constitute a day's work. At a meeting of the manufacturers' association held at Youngstown last week these demands were refused and the strike resulted. The foundries at Youngstown that are idle are as follows: Youngstown Engineering Co., William Tod Co., Lloyd Booth Department of the United Engineering & Foundry Co., George B. Sennett Co., Mahoning Foundry & Machine Co., Falcon Bronze Co., Youngstown Foundry & Machine Co., and the Scholl, Semple & Jordon Co. The Girard Foundry & Machine Co., at Girard, O., is in operation, this concern having signed the scale. The Republic Iron & Steel Co., and the Youngstown Steel Casting Co. are the only concerns at Youngstown that have signed the scale, while the Youngstown Bronze Co., whose plant has not yet been completed, has signified its intention of signing as soon as operations are commenced.

STRIKE IN THE BUFFALO UNION FURNACE CO.

Nearly 500 men, practically the entire working force of the Buffalo Union Furnace Co., Buffalo, went on strike July 23 on account of the discharge of John Manning, a foreman, who happens to be secretary of the Blast Furnace Workers' Union.

The company discharged Manning because of deception and insolence. When the strike came the company brought it to the attention of President Gompers, of the American Federation of Labor, but the local union would have nothing to do with Gompers, and James McMahon, national president of the Furnace Workers' Union, has gone to Buffalo to try to adjust the controversy. The strike was ordered without the consent of McMahon and other national officers and in direct violation of a contract between the company and its employes, which provides that there shall be no strike, but that all disputes shall be referred to arbitrators. There has been considerable violence at the plant and the blacksmith shop was set on fire.

PITTSBURG FOUNDRY TROUBLE.

No conference has yet been held between the molders in the Pittsburg district and the foundrymen, although it is expected that matters will be adjusted by the end of this week.

THE NEW YORK BUILDING SITUATION.

The board of governors of the New York Building Trades Employers' association on July 27 ordered all members of the association to start work on buildings at once, using any housesmiths, hoisting engineers and shorers who would individually sign their plan of arbitration. This means that work will be sarted on the greater part of the building operations throughout the city and that the men will be employed on them irrespective of whether they are union or not. The members of the association are confident that with this step taken the end of the building tie-up is well in sight, and that no difficulty will be experienced in obtaining men.

LABOR NOTES.

Lawrence Murphy was convicted in New York July 27 by the jury which heard the evidence before Judge Newburger in General Sessions on the charge that Murphy embezzled some $12,000 from the Journeymen Stonecutters' Association while he was its treasurer. Murphy's defense was that, as the money was extorted from employers by the Stonecutters' Union, the latter had not a legal title to it. The judge held that, even if the money were illegally acquired by the union, Murphy had no right to appropriate it to his own use.

J. H. Barker, president of the Haskell & Barker Car Co., Michigan City, Ind., has issued an ultimatum to labor agitators, threatening to close the car plant if the unions persist in the work of organizing. The company is one of the largest in Indiana, giving employment to 2,500 men, and for several weeks efforts have been made to organize unions. Mr. Barker declares that he will go out of business rather than be dictated to by the unions.

The strike of the iron molders in Providence, R. I., which was started in September, 1902, has been officially declared off. At three of the foundries, some of the men that went out last September have applied for work. In some places strikers find that their positions have been filled.

The Vulcan Foundry & Machine Co., Toledo, has placed its plant on a 9-hour basis.

As the result of a conference between machinists of the Big Four system and officers of the railroad, it has been decided that there will be no strike. The cause of the trouble, it is said, was a misunderstanding.

The boiler makers and apprentices, numbering about 145, in the employ of the Chicago, St. Paul, Minneapolis & Omaha Railroad, struck July 23, demanding payment of the Chicago scale of wages, $3.60 a day. The boiler makers are getting $3.25 and the company offered to pay $3.45, but the men refused.

The machinists at the Calumet Terminal shops, East Chicago, are on a strike, the officials refusing to sign the wage scale. The men are getting 31 cents an hour and want 36.

Upon orders of walking delegates about 150 men, structural iron workers and roofers on the machinery building at the World's Fair grounds, St. Louis, are on a strike, their claim being that the workmen building the elevated track are not union men.

In the preliminary testimony in the case against Lawrence Murphy, of New York City, charged with embezzling $12,000 from the Stone Cutters' Union, there have been some very interesting developments. It has been shown that $10,000 was extorted by the Stone Cutters' Union from the Stone Dealers' Association. It is expected that further evidence of extortion will be presented.

Stagnation in building operations and general depression in all industrial lines as a result of labor troubles have been testified to by business men before the board of review of Chicago recently. Contractors and manufacturers say that labor conditions have driven them to seek business in other cities. A number of contractors testified that the volume of Chicago business had never been at such a low ebb and each one named labor agitation as the chief cause of the trouble.

The following companies have signed the scale of the Amalgamated Association of Iron, Steel and Tin Workers during the past week: Kittanning Iron & Steel Manufacturing Co., Kittanning, Pa.; Newport Rolling Mill Co., Newport, Ky.; Inland Steel Co., Indiana Harbor, Ind.; Helmbacher Forge and Rolling Mill Co., St. Louis, Mo.

About 1,000 men employed by the A. S. Wilson Contracting Co. struck on July 27 at Pittsburg because the firm refused to sign the scale of the hoisting engineers. Unless the trouble is settled the builders' league threaten to order a general lockout of the twenty-seven crafts represented in the council.

The plant of the Newport Rolling Mill Co., Cincinnati, was closed last week on account of a strike of engineers and firemen. The controversy has been adjusted, however, and work will be resumed at once. The scale was fixed on an eight-hour basis, engineers on Corliss engines receiving $3 a day and on other engines $2.50. The firemen will receive 25 cents an hour for an eight-hour day.

When a Brush is Not a Brush.

A discussion of some interest to mechanics as well as importers of metals has recently been had before the United States Board of Classification. The Michigan Electric Co., of Detroit, imported some dynamo brushes, which, as is known by those having but a casual acquaintance with electrical machinery, are entirely different from many other things with a similar name. The likeness in name, however, started a controversy about the horns of the following dilemma: Are the articles to be classed as "manufactures of metal" or shall they be included in "brushes of all kinds?"

The customs officials assessed the articles at the rate of 45 percent ad valorem, under paragraph 193, as "manufactures of metal" and the electric company returned with the claim that the merchandise was properly assessable at but 40 percent, under paragraph 410, which provides for "brushes of all kinds." The importer maintained that the articles in question were known commercially as "dynamo brushes" or "generator brushes" and were, therefore, clearly included within the provisions of paragraph 410. The government demurred to this claim and called witnesses who swore that they dealt in all kinds of brushes and that the articles under protest were not included in the category of "brushes" as understood by the trade. General Appraiser Fischer, in his opinion for the board of classification, overrules the protest and says, in part: "The merchandise before us is called dynamo brushes for convenience in the electrical trade, but they are not brushes in the sense that brushes are commonly understood, nor within the understanding and meaning of dealers in brushes." An opinion which clearly indicates that, from the government point of view, dynamo brushes are not brushes.

The Northwestern Foundrymen's Association at its recent meeting at Marinette, Wis., elected the following officers: President, L. L. Prescott, of the D. Clint Prescott Co., Marinette and Menominee; vice president, J. F. Kern, of the Lake Shore Engine Works, Marquette; secretary and treasurer, Geo. Royce, of the Portage Lake Foundry & Machine Shops, Hancock, Mich.

The Montana Scrap Iron & Metal Co., Butte, Montana, has filed articles of incorporation. The concern is capitalized at $5,000, all of which has been subscribed.

THE BRITISH IRON TRADE IN 1902.

The annual statistical report of the British Iron Trade Association for 1902 has just been issued. The statistics below with the comment thereon, are abstracted from it. The writer of the report, Mr. J. S. Jeans, the association's secretary, comments on the activity of German iron manufacturers and merchants in British markets, and the comparative freedom from American competition both in British and in neutral markets as the noteworthy features of the British iron trade last year. British imports of American iron and steel were 114,651 tons less last year than in 1901. The increase in British iron imports from Germany was 160,000 tons in 1902 over 1901. "The same causes that brought about the decreased competition of America, induced a considerable demand by that country for European iron and steel, which benefited British manufacturers more than any other. The total American imports of iron and steel from Great Britain were 672,730 tons, while the corresponding American imports from Germany were 307,433 tons. It is thus clear that the American boom has to this extent been more advantageous to British than to German manufacturers, although the latter strained every nerve to secure the trade.

"Another prominent feature of the year has been the smaller variations of pig iron prices. The average prices of pig iron for the year 1902 were higher than those of 1901, but considerably under those of either 1899 or 1900. The prices of raw materials in 1902 have not been such as to facilitate any reduction of pig iron prices, even if the general conditions of business had not favored their maintenance at the average level of the year. Both iron ores and coke have averaged higher prices in 1902, and the small reduction obtained in the cost of blast furnace labor has not been a set-off to the differences in the cost of these materials. No doubt the exceptionally low stocks of iron in warrant stores and in makers' hands has had something to do with enabling pig iron makers to hold their own. At the end of 1902, Scotch and West Coast warrants were about 5s per ton higher than at the beginning, and Cleveland warrants about 7s 6d higher.

"One of the price features of 1902 was the decline in finished iron and steel, coincidently with an improvement in the prices of pig iron. In the case of acid steel, the difference is fairly well typified by ship plates, which were 12s 6d less at the end of 1902 than the corresponding price in 1901, while West Coast hematite iron was 2s 4d per ton dearer. This relation of raw material to finished product placed the steel manufacturer in a worse position by about 15s per ton, but against that there were reductions in the costs of labor and of fuel.

"In the home trade, the most unfavorable feature of the year has been the large decline in the production of new shipbuilding tonnage, and the consequent decline in the demand for ship plates and angles. This has seriously affected a number of works in Scotland and in the Cleveland district. The effect has been accentuated by the larger imports of German blooms, billets and bars, which these firms had more or less ordinarily produced for sale, but in which they found themselves unable in 1902 to compete with the low prices quoted by Germany. Prices of home plates, billets and bars have been lower than in the three or four preceding years, but the still high prices of pig iron and raw materials generally made it difficult to come down to the German level."

The report figures that the total production of pig iron in Great Britain in 1902 (8,517,693 tons) plus the pig iron imports and the imports of finished material stated in pig iron equivalents (227,338 tons of the former and 1,260,978 tons of the latter) was 9,988,316 tons. Of this amount 1,102,835 tons was exported as pig iron and it is figured that the exports of wholly or partly manufactured iron and steel amounted to 2,833,000 tons in terms of pig iron, while the exports of machinery were equivalent to 524,000 tons of pig iron and of tools, implements, hardware, wire, motors, etc., to 200,000 tons. Thus the exports of iron and steel from Great Britain in 1902 are taken to be equivalent to 4,659,835 tons.

This leaves 5,328,000 tons of pig iron that went into home consumption. The report distributes this as follows:

	Tons.
Used in shipbuilding	1,200,000
Used as general merchant iron and steel	1,108,000
Used for general foundry purposes	1,000,000
Used as machinery for home trade	700,000
Used for tin plates used in home market	220,000
Used as railway material	450,000
Used as tools, hardware, implements, etc	450,000
Used for naval, military purposes, etc	200,000
Total	5,328,000

The report estimates the value of the British iron trade of 1902, home and foreign, at £139,441,000, the pig iron being estimated at £3 per ton, iron and steel other than pig at £10 per ton, foundry castings at £12 and machinery at £40.

Iron Ore and Pig Iron Production.

The British imports of iron ore in 1902 were 6,341,272 tons from foreign countries and 98,485 tons from British possessions, a total of 6,439,757 tons. The total in 1901 was 5,548,888 tons; in 1900, 6,297,963 tons; in 1899, 7,054,578 tons; in 1898, 5,468,396 tons.

The production of British iron ores in 1902 was 13,426,217 tons, against 12,266,790 tons in 1901 and 14,028,206 tons in 1900.

The returns to the British Iron Trade Association, with estimates on 6¼ percent of the production, show that 8,517,693 tons of pig iron was produced in 1902, against 7,851,830 tons in 1901, 8,908,570 tons in 1900 and 9,305,319 tons in 1899. The total of foundry and forge was 3,727,294 tons; of hematite or Bessemer, 3,683,148 tons; of basic, 922,218 tons; of spiegeleisen, 185,033 tons. As compared with the two preceding years the make of different descriptions of pig iron was as follows:

	1900. Tons.	1901. Tons.	1902. Tons.
Forge and foundry	4,108,350	3,597,994	3,860,494
Hematite	3,636,839	3,177,684	3,648,948
Basic	924,987	794,787	a922,218
Spiegel	238,394	191,365	185,033
Totals	8,908,570	7,761,830	8,586,693

The average number of furnaces in blast in Great Britain in 1902 was 354, against 351 in 1901 and 397 in 1900. The eminence of the Cleveland (Middlesbro') district as a shipper of pig iron is shown in a total of 1,142,786 tons in 1902, while the West Coast shipped 418,913 tons and Scotland 386,758 tons, these being the three principal iron-making centers in Great Britain.

There are 557 blast furnaces in the United Kingdom and an average of 203 was out of blast in 1902.

Steel and Finished Material.

In the following table are presented details of the British make of open-hearth and Bessemer steel ingots for each of the last seven years:

Year.	Open-hearth. Tons.	Bessemer. Tons.	Total. Tons.
1896	2,317,555	1,815,842	4,133,397
1897	2,601,806	1,884,155	4,485,961
1898	2,806,600	1,759,386	4,565,986
1899	3,030,251	1,825,074	4,855,325
1900	3,156,050	1,745,004	4,901,054
1901	3,297,791	1,606,253	4,904,044
1902	3,103,288	1,745,779	4,849,067

Of the total of open-hearth ingots in 1902, 2,676,508 tons was acid and 406,780 tons basic steel. Of the Bessemer steel produced in 1902, 1,157,380 tons was acid and 668,399 tons basic Bessemer. It will be noticed that the total steel production for the past four years shows great uniformity. The steel rail production in 1902 was 903,216 tons, against 732,260 tons in 1901, 759,844 tons in 1900 and 838,148 tons in 1899. The production of the chief descriptions of finished Bessemer steel in 1902 and three previous years, of which particulars have been ascertained, was as under:

	1899. Tons.	1900. Tons.	1901. Tons.	1902. Tons.
Rails	838,148	759,814	732,280	903,216
Plates and angles	158,878	96,108	75,479	82,000
Sleepers and fish-plates	35,743	27,291	no record	23,200
Blooms and billets	355,335	280,220	175,800	192,250
Bars	a214,951	a221,795	a251,075	a262,000
Totals	1,603,055	1,385,228	1,234,634	1,463,266

a Including tin-plate bars.

The number of Bessemer converters built in Great Britain at the end of 1902 was 76, the same number as at the end of each of the two previous years. The number of converters in operation during 1902 was 60, 16 being inoperative.

Of the 1,528 puddling furnaces in the United Kingdom the average number active in 1902 was 1,186. The make of puddled bar in the United Kingdom in 1902 was 998,278 tons, against 974,385 tons in the previous year, showing an increase of 23,893 tons. This increase of output was confined to Scotland, Lancashire, North Staffordshire, and Derbyshire. The other

districts show a decreased output. As indicating the principal finished forms in which iron goes upon the market the following table is given for the three leading districts for 1902:

APPROXIMATE OUTPUT OF FINISHED IRON IN THREE LEADING DISTRICTS IN 1902.

	Scotland. Tons.	Cleveland. Tons.	Lancashire. Tons.
Bar Iron	96,258	44,662	54,927
Sheets	22,712	47,470	33,119
Nail Rods	1,075	—	—
Hoops	4,198	—	38,348
Angles	206	10,645	1,099
Strips	10,643	2,176	3,417
Rounds and Squares	15,772	13,224	19,820
Ship Plates	96	24,517	—
Wire Rods	61	—	65,450
Boiler Plates	—	11,895	1,679
Totals	151,021	124,589	217,859

Obituary.

On Sunday, July 19, as John H. McGrath, superintendent of the open-hearth department of the Inland Steel Co., was crossing the B. & O. Railroad tracks near his residence at Indiana Harbor, Ind., he was struck by the engine of a fast freight train and instantly killed. His burial on Wednesday, July 23, was at his boyhood home at Nashua, N. H. Mr. McGrath was well known in steel manufacture, having been connected, among other concerns, with the W. Dewees Wood Co., McKeesport, Pa., for several years. He was with the Midland Steel Co., at Muncie, Ind., for ten years and for the past two years he has been connected with the Inland Steel Co. He had been for a time, also, with the Burgess Company at Portsmouth, O. As a mark of the esteem in which he was held, the Inland plant suspended operations Sunday night, July 19, and Monday. His funeral at Indiana Harbor was attended by over 1,000 persons. Mr. McGrath was a native of Nashua, N. H., and was 47 years old. He leave a wife and three children.

Andrew J. Crawford, aged 65, an iron manufacturer, died at his home, Terre Haute, Ind., July 19. He was formerly president of the Virgo Iron Works, the Terre Haute Iron & Steel Co., and the Wabash Iron Co., three concerns which sold out to the Republic Iron & Steel Co.

E. W. Bliss, of the E. W. Bliss Co., of Brooklyn, N. Y., dropped dead in his library July 22, aged 67 years. At the time of his death Mr. Bliss was president of two large works which employ more than 1,300 skilled men—the United States Projectile Co., and the E. W. Bliss Co. The latter owns a plant comprising extensive shops for the manufacture of tools, presses and dies for use in sheet metal work, and various patented articles. It also controls the patents for the manufacture of the Whitehead torpedo, in use in the navy. The United States Projectile Co. manufactures most of the shells used in the large guns of the navy. Mr. Bliss also supplied part of the material for the Brooklyn bridge.

Elijah Cabble, a wire manufacturer for more than fifty years, died at his home, Brooklyn, on July 25. He was born in Flome, Eng., Aug. 10, 1831, and came to this country at the age of fifteen. He and his brother started in the wire business in 1850 in Brooklyn. The firm was known as the William Cabble Excelsior Wire Mfg. Co. Mr. Cabble invented several improvements in wire making, and the firm was considered one of the largest manufacturing houses in Brooklyn. He took entire charge of the business when his brother died in 1870.

Ohio Valley Steel Foundry Co.

The plant which the Ohio Valley Steel Foundry Co., Pittsburg, is building at Paden City, W. Va., will consist of five 25-ton open-hearth furnaces, one 24-inch bar mill and other necessary equipment complete to operate the plant, all of which has been contracted for with the exception of one 750-h. p. engine. The capacity of the plant will be about 2,000 tons of bars per month and about 750 tons of steel castings. The company will have two of the furnaces in operation by Nov. 1, and the entire plant will be in operation by Jan. 1.

It is reported that the rod mill at Cuyahoga Falls, O., formerly operated by the Hartman Mfg. Co., of New Castle, Pa., will be started up. It has been idle for 18 months.

PERSONAL.

J. S. Jeans, secretary of the British Iron Trade Association, and editor of the London *Iron and Coal Trades Review*, is expected to visit the United States in August.

President T. G. Bush, of the Alabama Consolidated Coal & Iron Co., Birmingham, Ala., has been appointed receiver for the Southern Car & Foundry Co., in addition to Thos. Gillespie, of West Orange, N. J.

Andrew Carnegie expects to return to the United States this fall at an earlier date than usual, to consult concerning the erection of the extension to the Carnegie library building at Pittsburg, as well as to plan for the contemplated Carnegie school of technology. He will sail from Queenstown, Oct. 1.

John A. Hock, superintendent of the National Tube Co., Youngstown department, has been transferred to a like position in the Continental department of the company. He will be succeeded by his brother, Henry Hock, now assistant superintendent. The change takes place Aug. 1.

Charles James, general manager of the Norway Iron & Steel Co., York City, Pa., has resigned to become general manager of the Berwick Malleable Iron Co., operated by the American Car Foundry Co., Berwick, Pa.

J. A. Kebler, president of the Colorado Fuel & Iron Co., has announced the promotion of General Sales Agent J. J. Welborn to be acting general manager, and of C. F. Parker ot be acting general sales agent.

J. Walter Wells, connected for the past five years with the State Bureau of Mines, of Ontario, Can., has joined the mining staff of the Lake Superior Power Co., and is at present, during the shipping season, at the Helen iron ore mine on the Michipicoten range.

Victor E. Edwards, of the Morgan Construction Co., Worcester, Mass., has returned from France, where he recently went in connection with a contract for a continuous rod mill and equipment.

Gorton W. Allen, of Auburn, N. Y., is to be the general manager of the new Aultman-Miller Buckeye Co., Akron, O., formerly the Aultman-Miller Co., whose harvester plant was recently purchased by Judge W. A. Vincent, of Chicago.

George Mesta, president of the Mesta Machine Co., of Pittsburg, will sail for Europe on Tuesday, Aug. 9. He will first visit Berlin and will then go to Dusseldorf to study the developments in the use of gas-driven blowing engines at blast furnaces. Before returning on Sept. 9 he will travel extensively through Germany and France.

Fischer Foundry & Machine Co. Extends Its Lines.

(Special Telegram.)

PITTSBURG, July 29.—The Fischer Foundry & Machine Co., South 21st St., has purchased all the patents, patterns, drawings and good will for the line of shears and punches manufactured by C. C. Wais, of Cincinnati. The manufacture and sale of these machines will now be conducted on a much larger scale than heretofore in connection with the Fischer company's line of general rolling mill machinery. Mr. Wais will have charge of the punch and shear department, as well as the designing of those machines to meet special requirements.

Presidency of the Colorado Fuel & Iron Co.

It is reliably reported that Col. Frank J. Hearne, who resigned some months ago as president of the National Tube Co., Pittsburg, has consented to accept the position of president of the Colorado Fuel & Iron Co., and that he will be elected to that position at the annual meeting to be held on Aug. 19. On Monday night, July 27, he left Pittsburg with his family for Denver, Col., and expected to be gone about three weeks. He refused to state, before leaving, whether he would inspect the properties of the Colorado Fuel & Iron Co.

Three of the blast furnaces of the Dominion Iron & Steel Co., at Sydney, N. S., were blown out on July 23 for repairs. Five open-hearth furnaces are off and the blooming mill is run single turn. Specifications are not in sufficient volume to require full operation at present.

LAKE SUPERIOR IRON MINES.

Two crews of men have been hired and are now at work on an attempt to reopen the old Breen iron mine at Waucedah, Mich. The mine, with mineral rights embracing several forties of land, still belongs to the Breen family.

Reports from different mines on the Mesabi range indicate a gradual reduction of the number of miners. The night force at the Jordan mine has been laid off and one of the shovels of the Stevenson mine is now out of service.

The Champion mine, Marquette range, half interest in which has passed into the hands of the U. S. Steel Corporation, in the recent Clairton Steel Co. purchase, is the deepest mine of the lake region, having 30 levels in No. 5 shaft, or a total depth of 1,800 feet. The old east end mine is pretty well exhausted, but very great development has taken place at the other end of the property. A hematite mine is being opened north of the old mine, and a magnetite has been found to the east of the property. The company has a large and efficient crushing plant, and possesses a large acreage, which may contain more ore than has yet been found within it. The Clairton mine, Mesabi range (down on the maps as the St. Clair) which is also included in the recent purchase, is with the Little property, also included, a tonnage of no small importance. The Clairton contains an excellent ore.

It is expected that the Buffalo & Susquehanna Iron Co. will erect a concentrating plant on lands near Iron Mountain, Mich., where it has taken the Frederichs exploration, a property that will require concentration. The property contains a very considerable body of ore, somewhat similar to that worked through the Pewabic concentrating mill.

The estate of J. M. Williams, of Chicago, fee owner of the Biwabik mine, has leased to Swallow & Hopkins and G. N. Holland, of Duluth, the ne ¼ of the se ¼ of section 4-58-16, where Holland has in the past year found a valuable mine of about 1,000,000 tons of high grade ore. The lessees have called for bids for taking off 150,000 yards of surface and will sink a shaft in rock, and propose to mine the property themselves by the milling process. They will make their first output in 1904. This was in 1893 the property of the Chicago Iron Co., fathered by A. E. Humphreys.

The Johnson Nickel Mining Co., a concern that has been exploring for titaniferous magnetites on the north short of Lake Superior, is alleged to be negotiating for a furnace site at a point on the south shore of the lake about 25 miles from Duluth.

The North Shore Reduction Co., a Chicago concern, is arranging to test the magnetic sands of the north shore of Lake Superior, near the Nepigon river, and is making large claims as to what it has there. There is said to be quite a market for the stock of this company in and near Chicago.

The Regent mines at Negaunee are not looking as well as a year ago, and considerable explorations will be carried on.

The reported find in No. 10 shaft of Tilden mine, at Ironwood, is not of such importance as local papers would have it appear.

Ten or twelve drills are at work in the district running two miles eastward from Biwabik, Mesabi range. Two are in section 1 on the north shore of Embarras lake for Elder, et al, and some ore has been cut. Four are working for the East Biwabik company at the old Merritt town site, and some ore has been found, and four or five are working in section 6 for the U. S. Steel Corporation.

In section 15, T 59 R 14, some ore has been found, and six pits are bottomed in hard ore, with a thickness proved of about 13 feet.

The Kinney mine, in section 14 T 58 R 19, is now shipping from initial development work and will take out about 75,000 tons this year. Its capacity is easily several times that. Less than one year ago the site of this mine was a virgin forest. It was about this time last year that a track was put down and a steam shovel taken in, the site cleared of timber and camps erected. More than 40 acres have been cleared of timber and brush and a hole from 40 to 50 feet deep, 100 feet wide and 300 feet long has been cut above the ore. The contracting company has a 2,000,000-yard hob there which is yet far from completed. Two large shovels are now stripping day and night and some 85,000 yards are removed monthly, but during June 91,000 yards were moved. A 3-compartment shaft, carrying a pair of 3-ton skips worked in balance, has been driven 115 feet vertically. Quicksand was encountered in sinking and considerable trouble was had in getting down, but the bottom timbers were shod with steel and the shaft built up from the top as it sank. Drifts are being driven and raises made to the surface of the ore in the stripped area. Milling down will commence in a week or two. Two pumps, No. 7 and No. 10, Cameron, keep the pit and mine free from water. The property is fairly well equipped with buildings, camps, etc., and there is an ample machinery plant.

An 80-acre tract in the E ½ of the S E ¼ of section 6 T 57 R 20 has been bought of the original lessees by the Minnesota Iron Co. It is a state lease and carries a total royalty of 35 cents a ton. It will not be opened at once.

What is called the Monroe mine, consisting of 120 acres in the E ½ of section 28 T 58 R 20, is to be opened at once, and bids for stripping have been called for. It is a very large mine, containing above 10,000,000 tons of excellent ore and will be an easy mining proposition, though possibly rather damp. This is the fifth mine in this square mile, and there are more to come.

Shipments of ore from Minnesota mines continue heavy, though from older ranges they are slack. Many Minnesota mines are falling off, also, but the gross volume of business holds up well. The laxity of shipments is more noticeable in the case of mines that ship over the Great Northern road than in those shipping via the Duluth & Iron Range or the Duluth, Missabe & Northern. But all records were broken at the Great Northern docks the other day, with a shipment in 11 hours of 68,884 tons. This meant nothing but that plenty of boats were available. It was all taken on 15 boats, an average of 4,592 gross tons per cargo. The Missabe road broke records, also, by passing 54,000 gross tons over the terminal scales in one day. Average ore weights at Two Harbors are now 1,000 car loads, or 25 trains, daily.

Lake freight records were again broken last Sunday by the Wm. Edenbom (Pittsburg Steamship Co.) with a cargo of 7,883 gross, 8,829 net, tons from the Northwestern docks at Ashland.

Interests connected with the International Harvester Co. have eight drills working at North Freedom, Wis., near Baraboo. They are also sinking a shaft and are drifting in ore. A small tonnage has been hoisted and tracks from the Chicago Northwestern's main line are under construction. Some ore will probably be shipped to South Chicago this year. C. T. Roberts, who is in charge of developments, thinks there may be 100,000,000 tons of ore in the new district, but any estimates at this time must obviously be very unreliable. None of the half dozen other interests working there is doing anything but drill work.

The Pennsylvania Railroad Co. has decided to spend $5,000,000 in extending its shop facilities and erecting a roundhouse in and about Altoona, Pa. An entirely new foundry plant is to be built at Burket, just outside of Altoona. It will consist of a wheel foundry and steel brass and gray iron foundries. The wheel foundry will have a capacity of 900 wheels daily, and will be the largest plant of its kind in the world. This foundry will be located in a building 602x226 feet. The gray iron foundry will be 500x160 feet and the core department will be in a separate building whose dimensions will be 160x60 feet. The boiler and power house will be 100x89 feet. The steel foundry will be 350x150 feet, while it is the intention to erect a brass foundry 300x175 feet. Pattern, storage and construction departments will be located in a building 200x150 feet. The contract for the steel structural work has been awarded the American Bridge Co. At Blair Furnace, Pa., immense repair shops and a roundhouse are to be erected. Machine, flue and blacksmith shops will be built and the roundhouse will be of sufficient size to take care of all engines in need of repairs on the Pennsylvania system, between Pittsburg and Philadelphia. Upon the completion of the foundry plant at Burket, all of the foundry departments at Altoona are to be removed to that place and the buildings thus vacated will be used in extending the blacksmith and machine shops.

The Frank M. Pierce Engine Co., New York, has nied a schedule showing liabilities to be $12,444, and assets $3,080.

NEWS OF THE BLAST FURNACES.

In connection with the mid-summer pig iron statistics the current issue of the *Bulletin* of the American Iron and Steel Association gives much interesting information concerning the plans and operations of the various blast furnace companies. We make a number of extracts in the following:

The Lackawanna Steel Co. had its new No. 1 and No. 2 furnaces, at West Seneca, N. Y., in blast on June 30. Furnaces Nos. 3, 4, 5, and 6 were all in course of erection. The company does not expect to have any of its building furnaces ready for blast this year, but No. 3 will probably be ready for work by Feb. 1, No. 4 by June 1, and No. 5 by Oct 1, 1904. It does not expect to have No. 6 completed until about Feb. 1, 1905.

The Buffalo & Susquehanna Iron Co. expects to have its two new coke furnaces at Buffalo, N. Y., ground for which was broken on July 24, 1902, completed and ready for blast late in the fall of 1903 or early in 1904. The furnaces will be 80 by 20 feet, and will each have a daily capacity of about 300 tons of foundry iron.

The Jones & Laughlin Steel Co., of Pittsburg, had all five of its furnaces in blast on June 30. On April 23 the company broke ground for a fifth Eliza furnace, which it expects to have ready for blast by Jan. 1, 1904. The stack will be 85 by 21 feet and will have an annual capacity of about 145,000 gross tons.

The National Tube Co. will shortly erect a third furnace at McKeesport, Pa. It will be 90 by 22 feet and will have an annual capacity of about 155,000 gross tons of Bessemer pig iron.

The Cambria Steel Co., of Johnstown, Pa., broke ground on May 3, 1903, for a new blast furnace. It is being built near the open-hearth steel plant of the company at Franklin, a suburb of Johnstown. The furnace will be 87 by 22 feet and will have an annual capacity of about 150,000 gross tons. It will probably be ready for blast in the fall of 1904. When it is completed the company will have 7 furnaces in all.

On June 30 the Carnegie Steel Co., which now operates the furnaces formerly owned by the National Steel Co., the American Steel Hoop Co., and the Sharon Steel Co., and is completing the furnaces which the Union Steel Co. commenced to erect in 1902, had 40 of its 43 furnaces in operation. In addition 5 furnaces were being built. The idle furnaces were one Edgar Thomson, to be blown in about Aug. 5; one Isabella, time of blowing in indefinite; and one Ohio, to be blown in about July 20. Two of the 5 building furnaces are located at South Sharon, Pa., will be known as No. 2 and No. 3, and will be ready for blast by Oct. 1; 2 are at Donora, 1 of which will be ready for blast about Oct. 1 and the other about Nov. 1; and 1 is at Youngstown, O., and will be ready for blast about Jan. 1, 1904. The 2 South Sharon furnaces are each to be 85 by 19 feet and each will have an annual capacity of about 140,000 gross tons of basic pig iron; the 2 Donora furnaces are to be 85 by 22 feet, with a daily capacity each of 500 tons; and the single Ohio furnace is to be 90 by 23 feet, with an annual capacity of 182,500 tons of Bessemer pig iron. The company has also commenced work on a new furnace at New Castle, Pa., which will take the number of its present No. 3 furnace. When the new furnace is blown in the old furnace will probably be dismantled. The new furnace is to be 94½ by 21 feet and is to have an annual capacity of about 182,500 gross tons.

The two Crown Point furnaces, at Crown Point, N. Y., formerly owned by the American Steel & Wire Co., have been purchased by Henry A. Hitner's Sons, of Philadelphia, dealers in scrap iron and steel, to be dismantled at once.

The Alabama Steel & Wire Co. expects to have its new 300-ton coke furnace at Gadsden, Ala., ready for blast by Oct. 1. It will be 90 by 20 feet. As soon as this furnace is completed it is the intention of the company to begin work on three additional furnaces of the same size.

The Rochester & Pittsburg Coal & Iron Co. had not completed, on June 30, the blast furnace it began to erect last year at Fall's Creek, near Du Bois, Pa. The company now expects to have the furnace in blast in September.

The two Wharton furnaces at Wharton, N. J., were in operation 26 weeks during the first half of 1903. The new furnace which Joseph Wharton is having erected at Wharton will be ready for blast before the close of the year. It will be 100 by 21 feet and will be known as No. 3.

The furnace of the Danville Bessemer Co., at Danville, Pa., may be leased, negotiations to that end now being under way. The furnace has not been in blast since 1900.

The Lackawanna Iron & Steel Co. had one of its two Bird Coleman furnaces at Cornwall and one of its two Colebrook furnaces at Lebanon in blast on June 30. The date when it will blow in its idle Bird Coleman and Colebrook furnaces has not been settled. The North Cornwall furnace of the company at Cornwall did not make pig iron during the first half of 1903.

The Virginia Iron, Coal & Coke Co. blew out Max Meadows furnace, at Max Meadows, Va., in June, but the furnace will be again in blast before the close of July. It ran for 23 weeks during the first half of the year.

The Tennessee Coal, Iron & Railroad Co. had 11 of its 17 furnaces in blast on June 30, namely, 1 Alice, 4 Bessemer, 4 Ensley, and 1 Oxmoor, all in Alabama, and 1 South Pittsburg, in Tennessee. The date when its idle Alice furnace will resume is uncertain, but its idle Bessemer and Ensley furnaces, which are being relined, will be ready for blast early in September. One of its Oxmoor furnaces is also being relined, and it, too, will shortly be ready for work. The date when the two idle South Pittsburg furnaces will blow in is very uncertain. The company is pushing work on its new furnace at Ensley, ground for which was broken on May 30, 1903. It expects to have it ready for blast in May or June, 1904. The furnace will be 85 by 20 feet and will have an annual capacity of 100,000 gross tons. During the first half of 1903 the company made a small quantity of Bessemer pig iron from Cuban ores.

The two Sheridan furnaces, at Sheridan, Pa., were idle during the first half of 1903. They have not been in blast for over a year.

The Andover Iron Co. expects to have its rebuilt furnace at Phillipsburg, N. J., ready for blast about Aug. 15. The furnace was last active in 1900.

There is no truth in the report that two additional furnaces will be built at South Chicago by the Illinois Steel Co.

The new furnace of the South Chicago Furnace Co. (Deering), at South Chicago, Ill., was practically completed on June 30 and will probably be blown in before the close of July. It is 80 by 19 feet and will have an annual capacity of 125,000 gross tons of Bessemer and foundry pig iron. The No. 1 furnace of the company blew in on Jan. 26, 1903, and has since been operated continuously.

The Youngstown Iron Sheet & Tube Co., of Youngstown, O., has not reached a definite conclusion concerning the erection of a blast furnace at Youngstown.

The Lorain Steel Co., of Lorain, O., one of the constituent companies of the United States Steel Corporation, is erecting two additional furnaces at Lorain, which will be known as No. 3 and No. 4. Each furnace will be 85 by 22 feet and will have an annual capacity of about 150,800 gross tons. Ground was broken for No. 3 on April 20 and for No. 4 on May 16. No. 3 will probably be ready for blast in May, 1904, and No. 4 in the following September.

The Colorado Fuel & Iron Co., of Denver, Col., had four of its five furnaces at Pueblo in operation on June 30. Its idle furnace is being relined and will be ready for blast about Aug. 20. The company is now erecting one additional furnace, which will be 85 by 20 feet and will be known as "furnace F."

The Jones & Laughlin Steel Co., Pittsburg, Pa., will erect 500 additional beehive coke ovens to provide the necessary coke required in the two additional stacks that are now being added to the Eliza group. The company now has about 1,400 ovens in operation adjoining the Eliza plant, the smoke and gases being carried off by means of high stacks, so that there is practically no annoyance from this source to the residents in this vicinity. Coal for this new group will be brought from the company's new ovens at Coal Center, on the Monongahela River.

Stack No. 1 of the Ohio plant of the Carnegie Steel Co., Youngstown, O., resumed operations Saturday, July 25, after being out since April 29. New stack No. 4 is expected to be in blast about the first of the year.

NOTES ON THE CONGRESS FOR APPLIED CHEMISTRY.

Bennett H. Brough, secretary of the Iron and Steel Institute, has presented to the council of that body a resume of the proceedings of the fifth International Congress for Applied Chemistry, held in Berlin, June 2-8, so far as they related to iron and steel. The papers covered by Mr. Brough's report, from which we make extracts below, were presented to the metallurgical section:

The first paper was by Professor Chesneau, Paris, on the determination of phosphorus in iron and steel, describing experiments made by Mr. E. Goutal to ascertain which of the two recognized methods should be considered the more accurate. The methods dealt with were that of Stockmann and Meineke by precipitation with phosphomolybdate, and that of Carnot by double precipitation with the same salt. The main difference between the two methods is that the latter effects the removal of the traces of arsenic that are met with in almost every iron. This arsenic is separated out by a second precipitation, and consequently the Carnot method is preferable.

Mr. F. W. Lürmann, of Osnabrück, urged the necessity for the introduction into practical work of methods for the determination of not merely the total oxygen in steel, but also for the separate estimation of the proportion of oxygen that could be combined with silicon, manganese, and aluminium. In mild steel, especially the harder qualities, a proportion of oxygen exceeding 0.15 percent is hurtful. Often the effects due to sulphur are erroneously attributed to oxygen. It had been observed that in order to obtain homogeneous steel less German ferro-silicon was required than English, although the two materials contained the same percentage of silicon. Possibly a portion of the silicate in English ferro-silicon was mechanically combined as silicon, or chemically dissolved. These circumstances indicate that a convenient method of determining the oxygen is needed. The method now employed of igniting the sample in a current of dry hydrogen does not give satisfactory results. In the discussion that ensued Mr. Holtz agreed that a rapid method was needed. Professor E. Heyn (Charlottenburg), Mr. F. Wald (Kladno), Mr. Osann (Berlin), and Professor Vogt (Christiania), also took part in the discussion.

Dr. Wedding, of Berlin, read an important paper on iron and hydrogen in which he summarized the published researches on the subject. He considered that, notwithstanding the numerous investigations made on the occurrence of inclusions of hydrogen in solid iron, the influence of the hydrogen in the iron was not yet perfectly clear. Investigations were needed regarding the high temperatures at which the maximum of hydrogen was absorbed, and also regarding the most suitable practical methods of removing the hydrogen absorbed and of thus rendering it innocuous. Further, it should be ascertained if hydrogen is the cause of the blow-holes in the iron, or if it is not rather by the evolution of other gases, such as nitrogen, that the hydrogen is merely mechanically removed from the iron alloy and so passes into the blow-holes. In the discussion Dr. T. Fischer stated that in his experiments in heating iron *in vacuo*, first arseniuretted hydrogen and then hydrogen itself were evolved. It appeared, therefore, as if impurities in the iron had a certain influence on the combination of hydrogen with iron. Moreover, by heating iron *in vacuo* the hydrogen was not completely removed. Mr. Brough directed attention to the experiments by Mr. John Parry communicated to the Iron and Steel Institute in 1872.

Mr. F. Wald, of Kladno, described an apparatus invented by him for determining oxygen in iron by means of hydrogen.

Dr. A. Haarmann, of Osnabrück, read an exhaustive paper on iron as a railway material. He gave a historical account of the development of railways and of the design of steel rails and sleepers. For rails, steel with an ultimate tensile strength of at least 60 kilogrammes per square millimetre, and containing 0.25 to 0.35 percent of carbon, was thought to be the best.

Prof. J. H. L. Vogt, of Christiania, dealt with the subject of molten solutions of silicates, a subject investigated by Akerman, whose researches he had carried further. Prof. Vogt also described the iron ore deposits, the ore from which would be exported from the north of Norway. In a few years the exports of iron ores from Norwegian ports would amount to at least 2,000,000 tons yearly. In discussion Dr. Holtz pointed out the relation of the Norwegian iron ore supplies to the German iron trade. For comparison he showed that German Luxemburg had 2,900 million tons of ore available, representing 900 million tons of iron. Lapland in one mine had four-ninths of the iron of the whole of German Luxemburg. Mr. Brough directed attention to the importance of the opening of the Lulea-Ofoten railway and the development of the Dunderland mines to the British iron trade, and Dr. Weiskopf, of Hanover, pointed out the difficulty of the magnetic concentration and of the molding of the ore into briquettes, the problems that the Dunderland company had to face.

The desirability of introducing standard methods for the determination of sulphur, phosphorus, and manganese in iron and steel was urged by Prof. Namias, of Milan, but after a lengthy discussion the meeting expressed an adverse view.

The paper by Prof. C. D. Zenghelis, of Athens, on the economic minerals of Greece contained recent statistics of mineral production, and enumerated the localities at which iron ore, manganese ore, brown coal, magnesite, and other minerals were worked. In 1902 the quantity of iron ore exported from Greece amounted to 543,189 tons, most of it being shipped to Newcastle-on-Tyne. The working of extensive deposits of iron ore at Lokris, a concession for which was granted in 1901, has as yet only begun on a small scale. The ore contains 65 to 72 percent of ferric oxide, together with 9.5 percent of silica, 3.10 percent of chromium oxide, and 0.38 percent of titanic acid. Iron ores are widely distributed throughout Greece, occurring usually in limestone or at the contact of the limestone with schist or granite. The principal mines worked are situated near Laurium, at Grammatico, near Marathon, at Seriphos, at Skyros, Kythnos, Siphnos, Lokris, Milos, Mykonos, and Syra.

Mr. C. E. Munroe, of Washington, submitted a statistical report on the present condition of the iron and steel industries in the United States.

In an exhaustive paper on metallography in the service of the metallurgist, Prof. Heyn, of Charlottenburg, emphasized the practical value of recent theoretical investigations, and reviewed the work of Roberts-Austen, Osmond, Stead and others. These researches of a physico-chemical nature relating to the solidification of alloys were of great importance, and it should be the aim of technical schools to disseminate modern views on the subject. Lastly, the subject of the manufacture of Portland cement from furnace slag was dealt with by Mr. Passow, of Hamburg.

In the section for electro-chemistry a paper was read by Dr. Goldschmidt, of Essen, on the production of steel in the electric furnace. Descriptions were given of the Gin-Leleux, Gysinge, Froges-Hèroult, Keller, Harmet, Schneider, Rubbenburg, and Conley furnaces. In other sections several papers of interest to metallurgists on liquid fuel and on power gas were read.

The annual meeting of the stockholders of the Mahoning Foundry & Machine Co. was held at Youngstown July 21, at which the following directors were elected: C. R. Darrow, L. E. Cochran, Mason Evans, G. M. McKelvey, Frederick G. Evans. The directors chose the following officers: President, C. R. Darrow; vice president, Mason Evans; secretary and treasurer, Frederick G. Evans.

The Brightman Mfg. Co., Shelby, O., manufacturer of shafting, contemplates starting a foundry. It has a building 135x30 feet which will be used as a molding room.

James Bonar & Co., Inc., of Pittsburg, announce that their new works, located at 40th St. and A. V. R. R. (office 516 Frick Building), are now completed and open for inspection. The company is prepared to do any kind of machine work, brass work, and galvanized iron work, and can test with steam or water to any pressure desired. The shop is modern and well equipped.

TRADE PUBLICATIONS.

The small catalogue of the Garry Iron & Steel Co., of Cleveland, deals with pneumatic, electric and hand power cranes which are shown in great variety, portable, jib, overhead traveling, locomotive, etc. Some mention is made of other interesting products, pneumatic jacks for either portable or railway pit purposes, straight air hoists with 4 to 10 feet hook lift, dolly bars for holding rivets on boiler, tonk, bridge or structural work, portable pneumatic and electric power plants and portable painting machines. There are numerous small but excellent illustrations.

The No. 5 catalogue of the Hill & Griffith Co., of Cincinnati, extends to 208 pages illustrated with many cuts relative to foundry supplies, everything in fact but metal, fuel and money. The work has an assortment of pointers in prose and poetry which have of course special reference to the trade of the molder and there are a number of pages of general information on hardening, remedies for bruises, burns, etc., which would be as useful in the machine shops as in the vicinity of the sand pile.

The Buck's Stove & Range Co., of St. Louis, has an elaborate catalogue of 202 pages for the season of 1903-4. The cover is in colors and the advertising department receives special mention. The foundries and offices of the company extend over five acres and there are 188,700 square feet of mounting and storage room in the plant.

Fire brick is the burden of the story told in the catalogues of the Jenkins & Reynolds Co., of Portsmouth, O., though the list of products comprises Portland and natural cement, pressed brick in all colors, mortar colors, fire clay, molding sand, etc. Tables showing numbers of various sizes of brick for different circles are given with analysis of clays and there are illustrated some special shapes in tiles. These being 10 x 32 x 36 inches and weighing 600 pounds each. They are used for annealing wire.

The circulars sent out by the Detroit Leather Specialty Co., of Detroit, Mich., are in ink, paper and illustration different to the general run of trade publications. The cuts are striking and informing and the merits of this make of packing for hydraulic, compressed air and other purposes are put pertinently.

A leaflet presents in a general way the work undertaken by the C. W. Hunt Co., of West New Brighton, Staten Island, N. Y., in the manufacture of industrial railways, locomotives, conveying machinery, hoisting engines, manila rope, etc. Another circular deals with steel tubs for ore, coal, clay, etc.

The booklet of the New Process Raw Hide Co., of Syracuse, N. Y., treats of the "sure thing" movement of gearing, that noise is expensive, that there is no "ring" to raw hide, and in numerous ways presents a lively argument for gears of the new process brand.

Two attractive circulars extol the merits of Graphite-Silica paint and the pipe joint compound made by the Joseph Dixon Crucible Co., of Jersey City, N. J. The folder with the title "Colors and Specifications" illustrates five classes of steel and iron construction and the circular on pipe joint compounds presents a pithy account of the steam fitter's experience with a stubborn pipe plug and points a moral for Dixon's product.

The ball and roller bearings of the Standard Roller Bearing Co., of Philadelphia, are exploited in detail in a recent catalogue. There are many cuts showing the adaptation of such bearings to machinery. The company is also prepared to furnish steel rollers, stay rods, short rolls, conical or tapered rolls of any size and quantity and of tool steel or machinery steel.

Catalogue No. 4, of the Milwaukee Boiler Co., of Milwaukee, Wis., is devoted to the Reynolds vertical boiler, standard and high pressure horizontal tubular boilers, Kelly dumping and rocking grates, portable fire box boilers, Reynolds feed water heaters, "Continental" boilers with Morrison's corrugated furnaces, foundry ladles, etc.

The general catalogue of the Michigan Sprocket Chain Co., of Detroit, Mich., will not be ready for mailing before the middle of August, and a preliminary catalogette, as it is termed, is sent out. The intention of the firm is not to enter the general field but to co-operate with manufacturers of elevating and conveying machinery. The later catalogue will contain complete lists with illustrations of plain chain and attachments as well as malleable and steel elevator buckets, elevator arms, special and clutch sprocket wheels and other goods of the firm's design. The company is affiliated with the Michigan Malleable Iron Co.

The Ashton Valve Co., of Boston, has a small pamphlet on water relief valves for pumps and water works, cylinder relief valves for steam engines and pressure and vacuum gauges for general purposes and of many forms. The gauges include a compound pressure and vacuum instrument which is graduated for pressures in pounds per square inch and for vacuum in inches of mercury column. These are made in a number of sizes. A pressure recording gauge is also listed which is serviceable for steam, water, air or gas. An impartial recorder of this kind on steam boilers cannot but be an incentive to regular and careful firing. A line of single bell chime whistles is also made.

The following circulars have been received from the Fort Wayne Electric Works, of Fort Wayne, Ind. The instruction book pertaining to Type K, single phase integrating induction wattmeters; fan motors for telephone booths; list of "Wood" direct current arc light generators operated in the United States; a description of a direct current series arc generator and its manufacture; standard alternating current switchboard panels for single phase circuits. The circulars also contain considerable information in regard to arc lamps, ground detectors, voltmeters, ammeters, switches, etc.

An index to pencil peculiarities and their special uses in mercantile and industrial work has been prepared by the Joseph Dixon Crucible Co., of Jersey City, N. J. Of course it has reference to the 1001 pencils of this make and explains the system of grading, the influence of the paper, quality of lead and shape of the cedar holder, etc. Pencil pointers are given which suggest the breadth of the work undertaken by the manufacturers, the appropriate fitting of the tool to the manifold purposes of pencilers. Few, indeed, take due advantage of this labor of adaptation and the little pamphlet will doubtless do good service in making a very convenient instrument of even greater utility.

American Locomotives Satisfactory.

James H. Workman, U. S. Consul-General, at Munich, writes as follows contradicting reports concerning American locomotives in Bavaria:

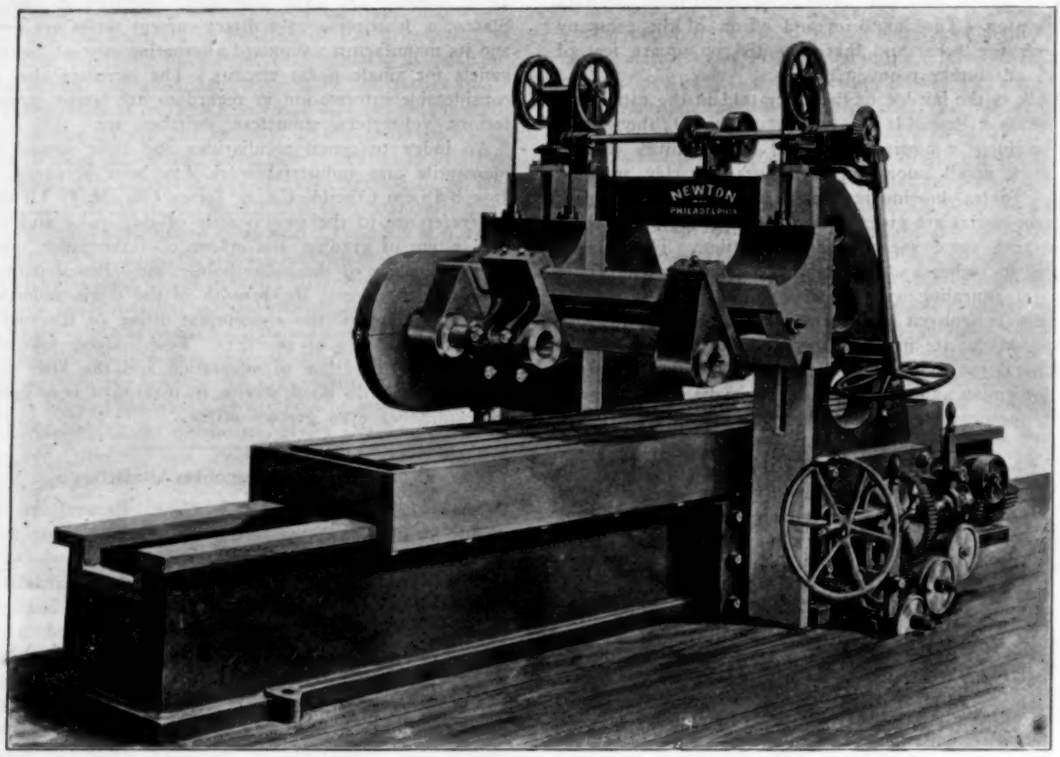
"The German papers have recently been circulating the report, and it has even gained currency in the English press, that the locomotives which have been purchased in America by the Bavarian state railways within the last three years had proven unsatisfactory, and that their durability had been called into question. In these reports it is also asserted that experts had declared that the American locomotives could only last at best from eight to ten years, while the locomotives manufactured in Bavaria had stood service for 30 years, and that for these reasons, as well as because of frequent necessary repairs, the further use of American locomotives had been abandoned. From official sources the information is obtained that these reports are unauthorized and wholly groundless. The facts are that the locomotives which had been bought in order to study the American system of locomotive building have proven, because of their simplicity, their originality of construction, and their remarkable locomotion for fast and freight trains, most acceptable, especially as to durability and efficiency, and that up to this time nothing has been discovered to warrant a statement that, with the same care bestowed upon them as upon the Bavarian locomotives, the American locomotives would prove less durable than those built here. Indeed many of the parts of construction have been found so simple and practical that they will be adopted in the construction of Bavarian locomotives."

The Horsburg Forging Co. has erected a new plant on Hamilton St., near Kirtland, Cleveland, and is installing one 2,500-pound hammer, one 800-pound, and one 1,500-pound, with other machinery. The company makes a specialty of ball bearing rings.

HEAVY MILLING MACHINE.

We illustrate a very heavy milling machine of an improved type which has just been built by the Newton Machine Tool Works, of Philadelphia. The machine can be supplied with either direct motor drive or with belt drive as desired and the power is transmitted to the spindle (which is 6 inches in diameter) by means of a steep lead, phosphor bronze, worm wheel and a hardened steel worm. Special attention has been given to the thrust bearings for the worm and the enclosure of the worm wheel in a casing to allow of profuse lubrication.

The crosshead of the machine is of unusual strength, with movable bearings for side adjustment to the cutters, is counterweighted and has both power and hand adjustment with a maximum distance from center of spindle to the table of 30 inches. The bed of the machine is of massive proportions to overcome any tendency to spring in clamping the work and has broad bearings for the table, the latter being 30 inches wide, and can be made any desired length. The table is operated by a rack and spiral pinion movement, having a variable friction disc feed. The machine can, however, be made with a positive feed, as desired, and a power quick movement in either direction. The milling machine as illustrated has a maximum distance between uprights of 36 inches.



HEAVY MILLING MACHINE OF RECENT DESIGN.

This milling machine was especially designed for the modern requirements of rapid milling on locomotive rods and is capable of working two rods simultaneously.

The Norcross Bros. Co., one of the oldest and largest building contracting concerns in the East, has been placed in the hands of receivers. Inability to complete contracts because of labor trouble is given as the principal reason for the firm's failure. The court named William E. Luey and Frank B. Smith, of Worcester, Mass., as receivers, and fixed their bond at $100,000. The petition on which the receiver was appointed states that the Norcross Bros. Co. has contracts outstanding amounting to $9,000,000, and that its total indebtedness is $500,000.

The General Electric Co., has completed the largest electric locomotive in the world. It is for the Baltimore & Ohio Railroad; weighs 180 lbs., and is designed to haul a freight train weighing 1,500 tons up a grade of 1½ percent. Its capacity is 2,000 horsepower.

New Agreement on Steel Billets.

For several months past the leading producers of steel in the United States have had an association, with a commissioner in New York, to whom monthly reports have been made of sales, including price and tonnage, in order that the general situation might be kept better in hand. Owing to the recent falling market the association decided to establish a uniform price, Bessemer billets 4x4 inches and slabs up to and including .20 carbon forming the basis. The basing price is $27 per ton, Pittsburg, Wheeling and the Mahoning and Shenango Valleys, Ashland Ky., Ironton, O., Johnstown, Pa., and Lorain, O. Eight of the largest steel producers are members of the association and are strictly adhering to the prices announced. The members of the association are the United States Steel Corporation, Jones & Laughlin Steel Co., Republic Iron & Steel Co., Lackawanna Steel Co., Wheeling Steel & Iron Co., Cambria Steel Co., Pennsylvania Steel Co. and the Maryland Steel Co.

In previous agreements the basing price has been limited to Pittsburg, Wheeling and Valley points but this has been extended in this agreement to take in Ironton, O., Ashland, Ky., Lorain, O., and Johnstown, Pa. At each of these points, with the exception of Ironton, O., which is almost opposite Ashland, Ky., on the Ohio river, one or more Bessemer steel plants are located. The price at Steelton, Pa., is $28 per ton while Baltimore has $28.25. The delivered price, f. o. b. cars in the Birmingham, Ala., district is $29.25, while that fixed for delivery at Denver, Col., is $40.25, and at San Francisco, and several other Pacific Coast points is $39.25. The prices at Joliet, Ill., and Chicago and Milwaukee, Wis., are the same, $28, while at Buffalo, N. Y., where the Lackawanna Steel Co. is located, the price is $27.75.

For open-hearth steel $1 per ton extra is charged. The following advances are made for carbon:

Bessemer Steel:

Up to and including .20 carbon—Base	
21 to .60 carbon	$1.00
.61 to 1.00 carbon	2.00

Open-hearth Steel:

Up to .60 carbon no extra charge.	
Over .60 carbon	$2.00

Billets smaller than 3⅞ inches and sheet and tin bars $1 per ton extra.

Slabs, 2½ inches and thinner, 24 inches and shorter and of a sectional area of 20 square inches or less, up to and including .20 carbon, $1.50 per ton over price of 4x4 billets. Same advance for higher carbons as above.

Small round cornered axle billets, .18 to .25 carbon, $1 per gross ton extra.

Open-hearth forging blooms, $3 per ton extra, which is in addition to regular extra of $1 per gross ton for open-hearth billets.

All quotations shall cover delivery at final destination, f. o. b. at point of proposed consumption.

Terms: Thirty days from date of invoice, with privilege of discounting at the rate of six percent per annum, or, one-half of 1 percent discount for cash against sight draft, bill of lading attached.

For cutting billets to short lengths an extra charge of 50 cents per ton will be made.

Quotations on Bessemer billets, 4x4 inches, and slabs up to and including .20 carbon, f. o. b. at point of destination are as follows:

Albany, N. Y.	**$28.75**
Atlanta, Ga.	29.75
Allentown, Pa.	28.75
Apollo, Pa.	27.50
Ashland, Ky.	**27.00**
Anniston, Ala.	29.25
Averyville, Ill.	28.25
Auburn, N. Y.	28.25
Akron, O.	27.50
Alliance, O.	27.50
Aliquippa, Pa	27.50
Altoona, Pa.	27.50
Allegheny, Pa.	27.50
Avenue, Pa.	27.50
Avonmore, Pa.	27.50
Buffalo, N. Y.	**27.75**
Bethlehem, Pa.	28.25
Baltimore, Md.	**28.25**
Birmingham, Ala.	**29.25**
Blairsville, Pa.	27.50
Brierfield, Ala.	29.25
Belleville, Ill.	28.75
Bridgetown, N. J.	28.75
Brooklyn, N. Y.	**28.75**
Bridgeport, O.	27.00
Bellaire, O.	27.00
Birdsboro, Pa.	28.25
Blanden, Pa.	28.25
Bellefonte, Pa.	28.25
Berinsk, Pa.	28.25
Bristol, Pa.	28.25
Burnham, Pa.	28.00
Beaver Falls, Pa.	27.50
Braddock, Pa.	27.00
Benwood, Pa.	27.00
Butler, Pa.	27.50
Braeburn, Pa.	27.50
Colonia, Pa.	27.50
Cortland, N. Y.	28.25
Clarksburg, Pa.	28.25
Clairton, Pa.	27.00
Cleveland, O.	**27.50**
Chicago, Ill.	**28.00**
Columbus, O.	
Cincinnati, O.	**27.75**
Covington, Ky.	27.75
Canton, O.	27.50
Cambridge, O.	27.50
Canal Dover, O.	27.50
Chattanooga, Tenn.	29.25
Cumberland, Md.	**27.50**
Carnegie, Pa.	27.50
Columbia, Pa.	28.25
Chester, Pa.	28.25
Crumlynne, Pa.	28.25
Conshohocken, Pa.	28.25
Catasaqua, Pa.	28.25
Coatesville, Pa.	28.25
Cohoes, N. Y.	28.75
Cuyahoga Falls, O.	28.50
Canonsburg, Pa.	27.50
Connellsville, Pa.	27.50
Charleroi, Pa.	27.25
Carthage, O.	27.75
Duluth, Minn.	**29.00**
Danville, Pa.	28.25
Duncansville, Pa.	27.50
Detroit, Mich.	**28.25**
Denver, Colo.	**40.25**
Dover, N. Y.	28.75
Douglassville, Pa.	28.25
Duncannon, Pa.	28.00
Demmler, Pa.	27.00
Donora, Pa.	27.00
Elwood City, Pa.	27.25
Edge Moor, Del	28.25
Elizabeth, N. J.	28.75
E. St. Louis, Ill.	28.75
Aetna, Pa.	27.00
Easton, Pa.	28.75
Erie, Pa.	27.75
Ensley, Ala.	**29.25**
Franklin, Pa.	27.75
Findlay, O.	28.00
Greensburg, Pa.	27.50
Glassport, Pa.	27.00
Granite City, Ill.	28.75
Grand Crossing, Ill.	28.00
Harrisburg, Pa.	**28.00**
Holidaysburg, Pa.	27.50
Hamilton, O.	27.75
High Bridge, N. J.	28.75
Harrison, N. J.	28.75
Harriman, Tenn.	29.25
Indiana Points	**28.25**
Ironton, O.	27.00
Irwin, Pa.	27.50
Johnstown, Pa.	**27.00**
Jersey City, N. J.	28.75
Jenkinston, Pa.	28.25
Joliet, Ill.	**28.00**
Kansas City, Mo.	29.75
Kewanee, Ill.	28.25
Kalamazoo, Mich.	28.25
Knoxville, Tenn.	29.25
Kittanning, Pa.	27.50
Louisville, Ky.	**28.25**
Leechburg, Pa.	27.50
Leetonia, O.	27.25
Lebanon, Pa.	28.25
Latrobe, Pa.	27.50
Lancaster, Pa.	28.25
Los Angeles, Cal.	**39.25**
Lockport, N. Y.	28.25
Lorain, O.	**27.00**
Lima, O.	28.00
Lewisburg, Pa.	28.25
Lock Haven, Pa.	28.25
Monessen, Pa.	27.50
Marietta, O.	27.50
Middletown, O.	27.25
Morgantown, W. Va.	28.25
Milwaukee, Wis.	**28.00**
Milton, Pa.	28.00
Marshallton, Del.	28.25
Maywood, Ill.	28.00
Moline, Ill	28.25
Melrose Park, Ill.	28.00
Muskegon, Mich.	28.25
Middletown, N. Y.	28.75
Massillon, O.	27.50
Martins Ferry, O.	27.50
McKeesport, Pa.	27.00
Mingo Junction, O.	27.00
Newport, Del.	28.25
New Castle, Del.	28.25
Niles, O.	27.50
Norristown, Pa.	28.25
Newark, N. J.	28.75
New York, N. Y.	**28.75**
Newport, Ky.	27.75
Newark, O.	27.50
Newcomerstown, O.	27.50
New Philadelphia, O.	27.50
Newburg, N. Y.	28.75
New England Points	**29.25**
Northumberland, Pa.	28.00
New Kensington, Pa.	27.25
Oil City, Pa.	27.75
Oxford, N. J.	28.75
Pittsburg, Pa.	**27.00**
Philadelphia, Pa., and immediate vicinity	**28.25**
Perth Amboy, N. J.	28.75
Parkersburg, W. Va.	28.25
Pottstown, Pa.	28.25
Pottsville, Pa.	28.25
Portsmouth, O.	27.25
Piqua, O.	27.75
Pueblo, Colo.	**40.25**
Pullman, Ill.	28.00
Phillipsburg, N. J.	28.75
Paterson, N. J.	28.75
Pompton, N. J.	28.75
Poughkeepsie, N. Y.	28.75

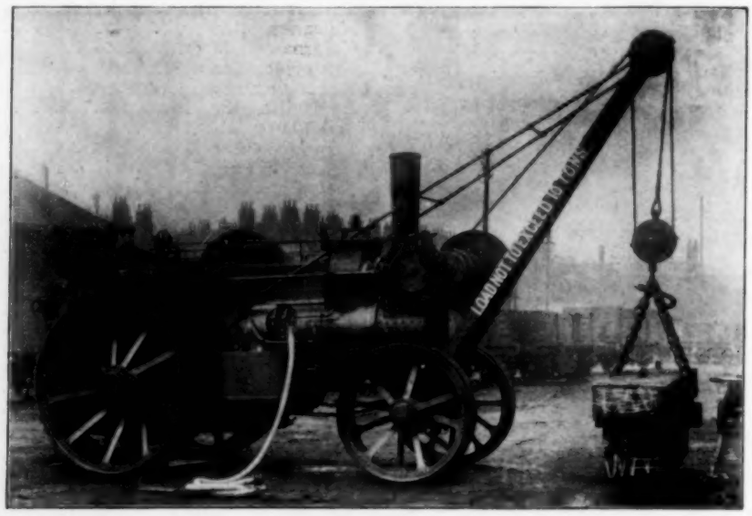
Port Chester, N. Y.	28.75
Portland, Ore.	**39.25**
Pine Iron Works, Pa.	28.25
Rock Island, Ill.	28.25
Rochester, N. Y.	28.25
Richmond, Va.	28.75
Roanoke, Va.	28.75
Reading, Pa.	**28.25**
Rome, Ga.	29.75
Rome, N. Y.	28.75
Riverside, O.	27.75
Rankin Station, Pa.	27.00
St. Louis, Mo.	28.75
Springfield, Ill.	28.25
Syracuse, N. Y.	28.25
Scranton, Pa.	28.25
Seattle, Wash.	39.25
Swissvale, a.	27.00
Saltsburg, Pa.	27.50
Steelton, Pa.	**28.00**
Sharon, Pa.	27.00
Sunbury, Pa.	28.00
Stirling, Ill.	28.25
Sharpsburg, Pa.	27.00
Shachmaxon, Pa.	28.25
San Francisco, Cal.	**39.25**
St. Joseph, Mo.	29.75
Spuyton Duyville, N. Y.	28.75
Steubenville, O.	27.00
Schuylkill Haven, Pa.	28.25
Seyfert Station, Pa.	28.25
Slatington, Pa.	28.25
Toledo, O.	**28.25**
Trenton, N. J.	**28.75**
Troy, N. Y.	28.75
Thurlow, Pa.	28.25
Titusville, Pa.	27.75
Valley Points, including Mahoning and Shenango Valleys	**27.00**
Verona, Pa.	27.25
Wheeling, W. Va.	**27.00**
Wyoming, Pa.	28.25
Waynesboro, Pa.	28.25
West Leechburg, Pa.	27.50
Waukesha, Wis.	28.00
Worchester, Mass.	28.25
Waukegan, Ill.	28.00
Wilkesbarre, Pa.	28.25
Wellsville, O.	27.25
Wilmington, Del.	28.25
Washington, Pa.	27.00
Watsontown, Pa.	28.00
Wyandotte, Mich.	28.25
West Bergen, N. J.	28.75
Williamsport, Pa.	28.25
York, Pa.	28.25
Zanesville, O.	27.50

The American Fork & Hoe Co., with headquarters in Cleveland, has acquired the plant of the Withinton Handle Co., Ft. Wayne, Ind. The company now controls the output and production of about 80 percent of the forks and hoes made in the United States. The company was organized about a year ago.

AN AUTOMOBILE CRANE.

John Fowler & Co. Ltd., Leeds, Eng., propose to send to St. Louis two special road locomotives, fitted with jib cranes capable of lifting up to ten tons, and several traction cars for business and military use. These will be in active operation during a portion of the pre-Exposition period.

The company manufactures crane engines to lift from 500 pounds up to 10 tons. The lighter weights are negotiated by a quick speed slewing crane, the hoisting being done by a sheave and rope on the crank shaft. The heavier weights are raised by a geared crane, the jib being mounted at the front end of the engine. The operator has no difficulty in controlling the hoisting gear and brake from his position on the footplate. This arrangement admits of the engine lifting a load and traveling with it, and by the steerage gear loads can be handled in confined spaces. It will be understood that Messrs. Fowler's system of applying cranes to road locomotives does not in any way lessen the usefulness of the latter for hauling purposes. For short journeys, and in works, there is no need to remove the crane; but, for long journeys, haulage, or temporary belt driving, the crane can be readily dismounted, if so desired. The company's class "B" compound road locomotive, fitted with a ten-ton jib crane, as shown in the accompanying illustration, has been found very useful in boiler works and similar establishments, while leading British agricultural societies have employed it year by year for handling heavy machinery in their show grounds.



AN AUTOMOBILE CRANE.

Officials of the American Car & Foundry Co. have issued a denial of the story that they are engaged in cutting prices on cars $200 to $225 each under last year's prices. An official made this statement: "The report is misleading. The fact is we have cut prices for cars merely to correspond with the recent decrease in pig iron prices. Cars cost anywhere from $800 to $900 and a cut of the amount named would reduce prices to a level below the panic prices of 1896."

The Horsburgh & Scott Co., which has been in business at 108 Canal St., Cleveland, for a number of years, has found its quarters inadequate to meet the demands of its business and has erected a new plant on Hamilton St. near Kirtland. The building is 120x55 feet, two stories, admirably lighted and well equipped with new machinery. The company manufactures gear wheels and will make a specialty of raw hide, noiseless gears.

The New Chattanooga Furnace Co., Chattanooga, Tenn., recently incorporated, is in all essential ways, the same as the Chattanooga Furnace Co. The stockholders simply desired to make some changes in their charter, and while doing this, thought it just as well to reorganize entirely.

THE LARGEST PIPE-BENDING ROLLS.

The United Engineering & Foundry Co., of Pittsburg, recently installed the largest pipe bending rolls ever built at the American Works of the National Tube Co., Youngstown, O. The rolls are 22 feet in length and are capable of bending pipe up to 20 inches in diameter. An order for a similar set of rolls have been received by this company for installation in the Middletown, O., plant of the National Tube Co.

The Standard Steel Tube Co., Toledo, O., recently incorporated with a capital of $60,000, will continue the business heretofore done and will enlarge same as much as possible. The company has no intention at present of going into any other business besides that of tubing of all kinds but states that it is going to make a specialty of "specialties" such as handles for stocks and dies, hand rails, towel racks and other matters of this class, in fact, is prepared to make anything out of tubing for which it receives an order and is soliciting business all along the line for this kind of articles.

Proposals for the two steel twin screw sea-going suction dredges which are to be used in opening channels in Lakes Erie and Michigan, were opened a few days ago. The bids were as follows: Maryland Steel Co., Sparrows Point, Md., $165,000 each. Time eleven months. Great Lakes Engineering Works, Detroit, $200,000 each. Time, twelve months and thirty days. The Bucyrus Co., South Milwaukee, $235,933 each. Time, ten months. John H. Dialogue & Son, Camden, N. J., $242,000 each. Time, fourteen months and sixteen months, respectively. The proposals are now being considered at Washington.

The directors of the Marietta Boiler Works Co., Marietta, O., will sell the plant and close up the business at once. The company has $30,000 worth of finished material on hand, and an indebtedness of $32,000.

The extensive plant of the Harrisburg Pipe & Pipe Bending Works, Harrisburg, Pa., is now completed. Making of steel will be started about Aug. 1.

ROLLING MILL IMPROVEMENTS AND ADDITIONS.

Despite the present lull in the iron and steel trade a number of concerns are contemplating the increase of their rolling capacity, and the greatest increase planned is in the merchant bar trade where the rolling capacity is already greatly in excess of the consumption. The following concerns expect to install additional rolling capacity:

Ewald Iron Co., Louisville, Ky., will add one 10-inch and one 12-inch mill. Contracts are to be awarded shortly.

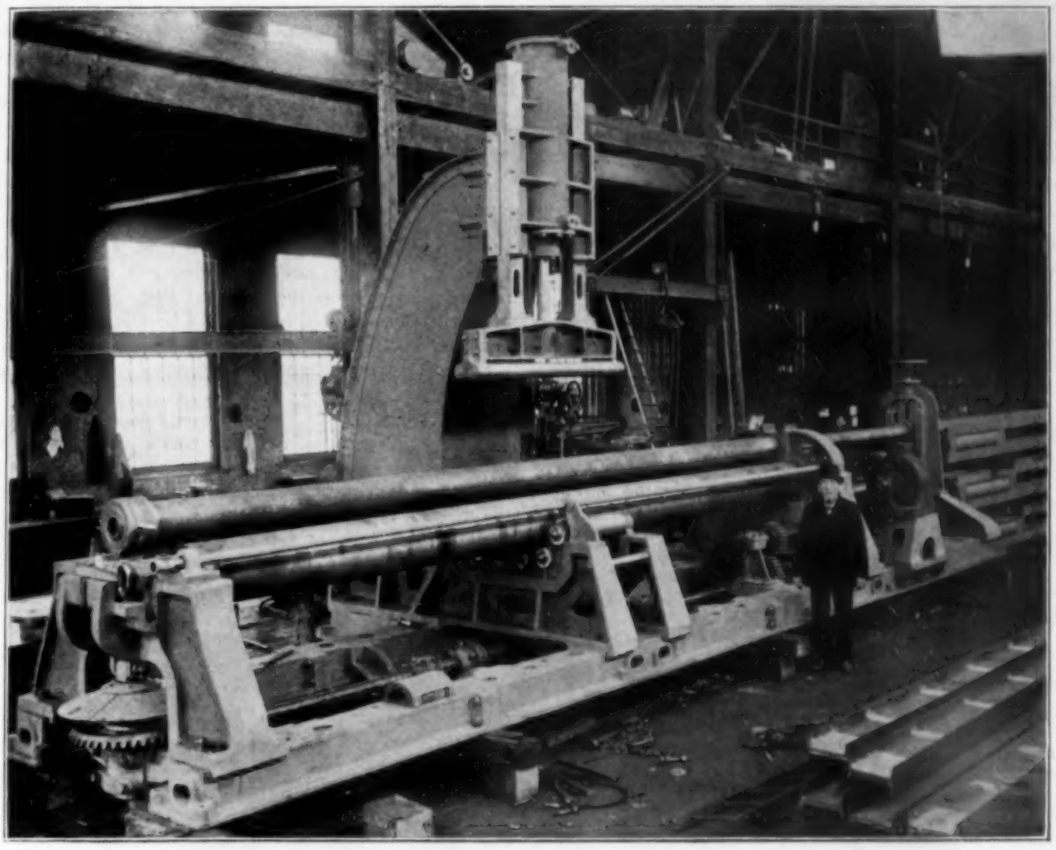
National Rolling Mill Co., Hartford City, Ind., will put in an 8-inch mill.

Paden Iron & Steel Co., Paden, W. Va., will install a 22-inch muck mill and a merchant mill.

Portland Iron & Steel Co., East Portland, Me., 16 and 8-inch merchant mills.

Dover Forge & Iron Co., Canal Dover, O., a three-high 22-inch mill as well as a muck mill.

The Atlanta Steel Hoop Co., Atlanta, Ga., is preparing to reroll rails and will build an 18-inch mill for this purpose. This is an entirely new venture with this concern, but on account of its location will no doubt prove profitable, as rails can be obtained from the Southern roads, and the lighter sections will find ready sale in the lumber regions throughout the South.



22-FOOT BENDING ROLLS BUILT BY THE UNITED ENGINEERING & FOUNDRY CO.

The Weller Rolling Mill & Forge Co., which recently purchased the plant of the Anniston Rolling Mill Co., Anniston, Ala., is making extensive repairs, with a view of placing the mill in operation at an early date. It is altogether probable that the rolling capacity will be increased.

The Baltimore Rolling Mill Co., of Baltimore, Md., will shortly operate its 10, 16 and 18-inch mills, contracts for which were placed some time ago.

The Kansas City Bolt & Nut Co., Kansas City, Mo., intends to install an 8-inch five-stand roll train.

The Judson Mfg. Co., Emeryville, Cal., is installing additional rolling capacity and is also contemplating the installation of further machinery.

A plate mill is contemplated by the Portsmouth Steel Co., of Wheeling, W. Va., at its Portsmouth, O., plant. Plates up to 30 inches will be rolled.

The Detroit Copper & Brass Rolling Mills contemplate the installation of 20 and 22-inch sheet mills.

MOTOR-DRIVEN BOLT CUTTER.

A new bolt cutter has been brought out by the Reliance Machine & Tool Co., of Cleveland, and is illustrated in Figs. 1 and 2, the former showing the front view of the machine with controller and operating levers while the latter illustration gives a better idea of the train of gearing from the motor to the main spindle of the machine. This particular machine shows some decided changes from the design of the average machine of this class.

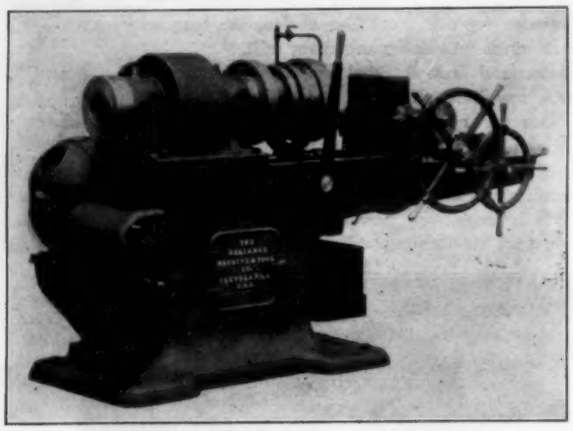


FIG. 1.—A NEW BOLT CUTTER.

The tool as shown is a 3-inch bolt cutter equipped with a Crocker-Wheeler motor and controller, but the distinctive feature of the driving mechanism is in the method of application to the main spindle. The shaft gear or main spindle driving gear is located centrally between the bearings of the spindle instead of being at the back or extreme end of it. A system of compound gearing makes it possible to obtain the greater leverage without an awkwardly large driving gear. The method of driving the head spindle eliminates so much of the torsion and adds to the assurance of a smooth and more rapid cut.

The oil and chips which work through a hollow spindle are no longer a source of trouble by dropping upon the belt and pulley. The working parts are all easily accessible and the floor space has been reduced by the compact design of the machine. The machine illustrated has been accepted by the constructing department of the United States Navy Yard.

The machine is also readily adapted to belt driving and in that case a four-step cone pulley replaces the gear meshing with the motor pinion.

THE SMALL CONVERTER FOR STEEL CASTINGS.

BY ARTHUR SIMONSON.

In these days of high pressure and high speed, when machines and engines are called upon to bear heavier loads and stand greater strains than ever before, the use of steel castings in their construction is being more and more specified, and the need for a process of manufacture which will meet the requirements has become very great, especially for the smaller castings, say below 100 pounds in weight. The open-hearth process takes care of anything over this weight with ease and with greater economy probably than any other process, but buyers and users of steel castings find difficulty in getting their small work from the open-hearth people; in fact a gentleman connected with one of the principal shipyards in the United States recently told the writer that they had as yet been unable to obtain delivery of some small flanges that had been ordered two years.

The conditions to be met are as follows: The material must be genuine steel similar in composition and strength to the open-hearth, not semi-steel, or modified malleable iron of doubtful composition and properties; it must be very fluid in the ladle, in order to run the delicate and intricate patterns called for, and deliveries must be made as quickly as possible. Price is a secondary consideration, as buyers are willing to pay almost any price so long as they get good castings quickly. They must be free from blowholes, easily machined, and those which do not require to be machined must have a very fine skin, requiring very little chipping or filing.

The small converter process meets all these conditions with perfect satisfaction, as has been proved by ten years of operation in Europe and three or four years in the United States. By its use castings from one ounce upwards can be made and in most cases they can be molded and cast one day, and cleaned and shipped the next, as they do not require annealing. This speed of delivery will be appreciated by any who have suffered the inconvenience of waiting many days or weeks for a steel casting to repair a breakdown, or get out a machine or engine on time.

The capacity of the converters is usually about two tons; they are acid lined and the daily output varies from two tons to as much as twenty tons. The patterns may be bedded in the floor or made in snap molds, which do not require to be dried; the metal is handled in ordinary hand or bull ladles, just the same as gray iron, in fact if a small converter is introduced into a gray iron foundry, the iron molders can make the molds and carry and pour the steel exactly as they have been accustomed to do iron. The only difference is that a different facing sand is used. In some cases, when small allowance is made for machining, or the shape of the pattern renders the mold particularly liable to cut in pouring, it may be skin dried, or coated with liquid mold wash and dried in the drying oven. Castings are being continually made up to as much as 15 feet in

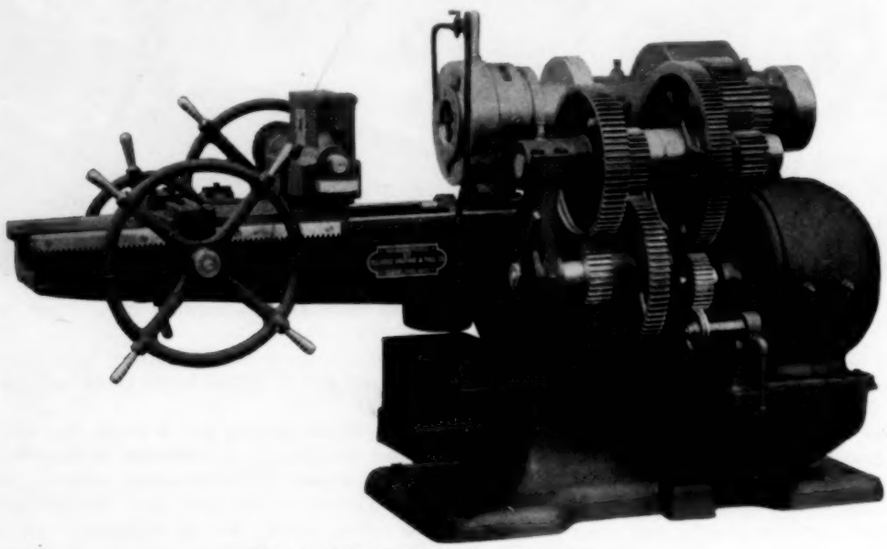


FIG. 2.—REAR VIEW OF NEW BOLT CUTTER.

length in molds skin-dried with a coal oil brazing torch. As these castings weigh less than 1,000 pounds, it will be seen that their section is very light, and, as a matter of fact, it would be very difficult to make them in dry sand molds as the shrinkage in length of such a piece is over three inches and the casting would be pulled apart in a hard mold when contracting.

The steel making process consists in melting a carefully calculated mixture of pig iron and steel scrap in an ordinary cupola and transferring it to the converter, where it is blown by surface blast. The duration of the blow is about twenty minutes, at the end of which time there remains in the conventer a bath of practically pure iron at a temperature of about 3,300 degrees. Recarburization is made in the converter if the entire heat is required of the same composition, or, in the individual ladles by means of carefully weighed packets of "physic," if it is required to make several different kinds of steel out of the same heat. The whole process is free from any complication, is under perfect control, and any intelligent man can learn how to run the blows in the converter in a short time.

There have been several small converter processes invented, but the only one that has given commercial satisfaction is the Tropenas process, such as is in operation at the plant of Wm. Wharton, Jr. & Co., Inc., Philadelphia, which was started two years ago. A plant has also been recently put in operation by the United States Government at the Washington Navy Yard. Since the plant was started by Messrs. Wm. Wharton, Jr. & Co., Inc., over 700 blows have been made without a single mishap. In any process of making steel in an acid lined furnace, the chemical action is the same, and consists in removing, by oxidation, the bulk of the carbon, silicon and manganese contained in a bath of crude metal introduced into the furnace. The action may be stopped when the desired amount of these elements has been eliminated, leaving the required percentages in the metal, or it may be continued till they are at the lowest limit, after which the exact amount of each is introduced by a weighed final addition. The latter is by far the safest and most accurate method.

Sulphur and phosphorus are not perceptibly reduced by any of the acid lined furnaces, despite the claims of some inventors to the contrary, hence it is necessary that in purchasing melting stock these elements should be kept as low as possible. The phosphorus should not exceed .035 percent nor the sulphur .030 percent in the pig iron. The tendency is for the resulting percentages of sulphur and phosphorus to be slightly higher in the finished steel, on account of the shrinkage in bulk, due to the elimination of about two percent of silicon, three-quarters of one percent of manganese, and three percent of carbon, and the oxidation of a small amount of iron.

This renders these processes unsuitable for the manufacture of high grade tool steel, although, if the melting stock is low enough in sulphur and phosphorus, it can be made readily. Even under ordinary circumstances a fair grade of miner's drill steel and manganese steel can be satisfactorily made.

In the Tropenas converter, the loss in weight during the blowing process is about 10 percent. Small converter processes have been criticised adversely on account of this loss, but when it is considered that almost 6 percent of this loss is composed of the carbon, silicon and manganese, which have taken the place of fuel and by their combustion raised the temperature of the bath, it cannot be considered as waste, though lost.

The Tropenas plant consists of a converter lined with silica brick and having two rows of tuyeres placed horizontally through the side of the vessel and extending round a portion only of the circumference. Before commencing the blow, sufficient iron is tapped into a ladle from the cupola and poured into the converter, to bring the level just up to the bottom edge of the lower tuyeres, when the converter is inclined at a small angle to the vertical, making the tuyeres slope down slightly towards the surface of the bath. Blast at a pressure of about three pounds is turned on from a positive pressure blower through the lower tuyeres only, the upper ones remaining closed at this stage. The oxidation then commences, and the silicon is eliminated during the first period of the blow, at the same time the carbon being changed from the graphitic to the combined state. When, by the combustion of the silicon, the temperature has been raised to a certain point, the carbon and manganese commence to burn, and it should be so arranged that the initial silicon is not too high, for above a certain temperature the oxygen will combine with the carbon rather than the silicon, and the resulting silicon in the steel will be too high.

At the point where the carbon-manganese flame makes its appearance, the upper tuyeres are opened at the discretion of the operator to a greater or less degree and by this means the carbon, which is partially consumed by the action of the lower tuyeres, is supplied with supplementary oxygen and completely burned to CO_2, generating more heat, which is absorbed by the steel. This is one of the important features of the Tropenas process and contributes largely to its success, as it makes the steel very hot and fluid. In the second period of the blow, clearly indicated by the flame coming out of the mouth of the converter, the manganese is being rapidly eliminated, in fact, sometimes the gas is generated so rapidly as to cause the bath to appear to boil and projections of small amounts of slag take place at the mouth of the vessel, these being caused by the explosion of the bubbles of gas passing through the slag. By watching the indications at the mouth of the converter, the operator has a very good physical check on the chemical analysis of his cupola mixture; if the carbon flame is too long in making its appearance, the silicon is too high. This time should be only four or five minutes. If the flame comes too soon, the silicon is low, and the blow will probably be less hot than usual. If, in the second period, the blow is dirty, that is, throws out a great many projections, he should look to the manganese for an explanation. During the last period, the carbon is gradually burned out, the flame finally dies down and the blow is finished. To keep the blast on after the flame drops, would be to burn the iron and ruin the lining of the converter, but the indications are much too clear to allow of such a mistake being easily made. When the flame falls, the converter is turned down to bring the metal clear away from the tuyeres, the blast is shut off, and the final addition of ferro-manganese, spiegel and so forth is made, either cold or melted, as the case may be. A skimming device is fixed in the mouth of the converter, and it is then used as a reservoir from which the bull ladles are filled as rapidly as they can be carried away and poured, the converter being fitted with an electric motor and controller for tilting purposes.

The appended table shows the action of the air on the bath during the progress of the blow. It indicates clearly the chemical changes taking place, and their sequence, the "silicon," "manganese," and "carbon" periods, and also the inertia of sulphur and phosphorus.

TABLE SHOWING CHEMICAL ACTION IN THE CONVERTER.

METAL SAMPLES.

	Metal direct from Cupola before Blowing.	After five minutes Blowing.	After twelve minutes Blowing.	After fourteen minutes Blowing.	After eighteen minutes Blowing.	End of Blow.	After final Addition.
Graphitic Carbon	3.18	2.92	.....	.....	.....	.....	.....
Combined Carbon	0.35	0.34	2.90	2.30	0.86	0.10	0.24
Silicon	2.21	1.62	0.466	0.382	0.084	0.074	0.326
Sulphur	0.037	0.037	0.035	0.036	0.038	0.038	0.037
Phosphorus	0.054	0.053	0.054	0.054	0.051	0.050	0.058
Manganese	0.61	0.60	0.101	0.040	0.040	0.042	1.08

SLAGS.

Si. O_2	49.55	36.75	42.50	50.90	51.00	This sample was not reliable, being contaminated with a portion of the lining of the Converter.	61.30
$Fe._2 O_3$	3.27	3.28	4.05	5.85	5.85		7.90
Fe. O	5.52	45.90	39.85	29.00	28.40		16.31
$Al._2 O_3$	8.90	2.80	2.10	2.05	2.01		2.35
Ca. O	24.50	1.80	1.70	1.55	1.55		1.75
Mg. O	0.54	0.360	0.234	0.234	0.200		0.396
$P_2 O_5$	Trace	Trace	Trace	Trace	Trace		Trace
S	0.076	Trace	Trace	Trace	Trace		Trace
Mn. O	8.37	9.87	9.12	9.90	10.04		10.416

To show the ease with which the process is handled and the complete control over it the following is a description of an ordinary day's work in a Tropenas foundry. The forenoon is devoted to making the green sand molds and fitting up any that have been dried in the oven over night. At the same time the cupola is daubed up and got

ready for lighting, and a coke fire is started in the converter. When the wind goes on the cupola, a gentle blast is also turned on the converter, and, by the time the iron is melted in the cupola the lining of the converter is white hot. The coke is dumped out and the iron put in, when the blowing proper immediately commences. Twenty-five minutes later the molders are pouring steel and it takes them about twenty minutes to pour off the heat. By that time the next charge of iron is ready for the converter, and from then on a heat is ready to be poured every forty-five or fifty minutes. If the first heat is commenced at 2 o'clock, by 6 o'clock ten tons of steel can be poured, which means a great many very small castings. When the pouring is all done, the bottom is dropped and the plant shut down till next day. This is repeated every day, from Monday to Friday, and the necessary repairs to converter and cupola linings are made on Saturday.

At the plant mentioned above, three principal grades of steel are made, although any specifications can be met, either as to analysis or physical properties.

No. 1.	For electrical purposes: — Comb. C. 0.10. Si. 0.070. Mn. 0.05	S. 0.04 P. 0.05
No. 2.	For general machinery: — Comb. C. 0.30. Si. 0.25. Mn. 0.75	
No. 3.	For gears, hydraulic and R. R. work:—Comb. C. 0.42. Si. 0.30. Mn. 0.90	

The first has a tensile strength of about 50,000 pounds; the second, 65 to 75,000 pounds, and the third, 75 to 85,000 pounds.

As to the cost, the steel in the ladle, ready to pour, costs to-day about two cents per pound. The cost of finished castings is in proportion to the skill of the molders, and the equipment and management of the foundry.

In conclusion, it may be stated as the writer's opinion, that the ideal situation for a small converter plant is as a side line to an open-hearth plant, where it can select the castings best suited to its capacity and make all the other castings that cannot be possibly, or at least economically, be made by the open-hearth. Under these conditions the fixed charges and cost of operating would be reduced to the minimum.

The Wrought Iron Range Co., one of the largest concerns of its kind in the West, has decided to move its entire plant in St. Louis to East St. Louis, Ill. The main reasons for change of location are given as failure of the Terminal Association to promptly handle goods between St. Louis and East St. Louis, lack of terminals on the Missouri side of the river, bridge charges which amount to $8,000 a year, and the increase of the value of property on which the plant is now located. The new plant will be built at an estimated cost of $1,500,000. The company is one of the pioneer manufacturing plants of St. Louis, which was founded in 1864, and its present officers are: H. H. Culver, president; W. L. Culver, vice president; Edwin R. Culver, treasurer, and V. B. Culver, secretary.

The Hyde Steel Tool Co., Syracuse, N. Y., which has been manufacturing stocks and dies for plumbers and steamfitters for a year and a half, is enlarging its plant to some extent. The plans and specifications are in the hands of the contractors. Specifications are being made for both steam and electric power. The company will use 12 grinding machines, 10 polishers, and will equip a large foundry. In the present plant there are 2 turret lathes, 4 grinders, and 2 milling machines. As soon as the plant is completed the company expects to make axes, hammers, hatchets, wrenches, tube expanders and other kinds of steel tools. It announces that these will be made of malleable iron, converted into steel.

The commerce of the United States with its non-contiguous territory for the fiscal year ending June, 1903, will amount to nearly $100,000,000. The figures for 11 months amounted to $86,581,026. The shipments of iron and steel manufacturers to the new possessions include the following: To the Hawaiian Islands, $1,000,000; to Porto Rico, $1,225,000; to the Philippines, $500,000; to Alaska, nearly $2,000,000; to Guam and Tutuila, $13,067.

For the first time for several years some of the furnaces in eastern Pennsylvania are storing pig iron. The Empire Steel & Iron Co. has about 2,000 tons on hand at Reading, Pa.

STANDARD TEST BARS FOR CAST IRON.*

BY ALEX. E. OUTERBRIDGE, JR.

It is a fact well known to founders that the physical properties of cast iron, such as strength, hardness, ductility, coarse-grainedness or "fracture," etc., depend not alone upon the chemical constitution but also upon the rate of cooling of the metal from the fluid to the solid state. It is quite possible to obtain from one ladle of molten pig iron, castings having widely different physical properties, covering the entire range from hard to white iron to soft gray metal, by simply regulating the rate of cooling of the iron when poured into the castings. This may be accomplished in a variety of ways, as follows:

1. Let us assume that we have metal of approximately the following composition in a ladle:

Graphitic carbon	3.00 per cent
Combined carbon	.75 per cent
Silicon	.65 per cent
Manganese	.15 per cent
Phosphorus	.50 per cent
Sulphur	.10 per cent
Iron	94.85 per cent

Suppose that we cast this metal into a solid wedge-shaped bar six feet long, six inches square at the thick end, tapering to one-quarter inch square section at the thin end. If we break the bar into short pieces, say about six inches in length, we will find almost every grade of cast iron (as shown by the fracture) from white iron at the thin end of the wedge, to dark gray metal with coarse grained fracture at the thick end. Between these two extremes we will find intermediate grades of cast iron. If we now cut from the gray portion of the bar, pieces of convenient size for tensile tests, we will find, on pulling them in a testing machine, astonishing variations in the strength of the metal.

A chilled cast iron car wheel is a more familiar illustration of a casting having widely different physical properties in its different portions, depending upon the rate of cooling of the metal. The "tread," or rim, which is cooled quickly, is white iron while the "plate" or body of the wheel, which is cooled more slowly, is gray, and the hub, which "sets" still more slowly, is usually quite soft coarse grained dark gray metal. Tensile tests of the gray iron in the plate and of that in the hub of a wheel show great difference in strength. In one test the iron from the plate of a wheel gave tensile strength of about 30,000 pounds per square inch, while the metal from the hub of the same wheel showed tensile strength of less than 20,000 pounds per square inch. The metal from the plate was comparatively fine grained while that cut from the hub was coarse grained.

2. If we should cast a solid block of iron, say about 15 x 15 x 15 inches, and should plane off the surfaces, then cut up the block into a large number of bars, say 1 x 1 x 14 inches, for transverse and tensile tests, we would find an enormous difference in the strength of the metal from different portions of the casting. The bars from the center of the block would be much weaker than those from the outer portion, while the fracture would show very much coarser grain and darker color in the bars cut from the interior of the block as compared with those from the outer portion.

3. If we should cast several test bars from one ladle of iron, all of the same length, say 15 inches, but varying in thickness, let us say, from 1¼ to 2¼ inches diameter, we would find if we should pull the bars on a testing machine, astonishing differences in tensile strength, the larger bars having as a a rule much less strength per square inch than the bars of smaller diameter.

4. If we should cast several test bars all of the same size, from one ladle of iron and cool some of them rapidly, others slowly, we would find remarkable differences in strength and resilience of the bars. Those which had been cooled quickly, would, as a rule, be much stronger than those which were cooled slowly. I am assuming in all cases except the first that the metal would be entirely gray in the castings, i. e., free from any tendency to mottled iron.

In the first case cited, I selected a "high chilling" mixture

*Read at the Delaware Water Gap meeting of the American Society for Testing Materials, July 2, 1903.

(low in silicon), corresponding to car wheel iron, in order to present the greatest contrast in the physical properties of the metal in different parts of the wedge shaped bar, ranging from white iron at the thin end to dark gray coarse grained metal at the thick end, as well as in different portions of a chilled cast iron car wheel. It is not necessary, however, that we should select special metal for such tests. The law holds good for all grades and kinds of iron commonly employed for castings.

The second experiment referred to, viz., the casting of a solid block of iron about 15 x 15 x 15 inches, is not a hypothetical case, but was an actual experiment which I made in 1888, a brief description of which may be found in the proceedings of the fifth annual meeting of the American Society for Testing Materials, page 214. This block was cast from an ordinary foundry mixture, such as is commonly used for miscellaneous castings. The block was planed and sawed into eight slabs of one inch thickness each. The slabs were then cut into bars 1 inch x 1 inch x 14 inch, making in all 64 test bars. They were numbered serially and then broken on a transverse testing machine with supports 12 inches apart. The highest records of strength were found in the outside rows in accordance with expectation. The average breaking stress of the bars forming the bottom row, for example, was 2,800 lbs., the fracture being close grained. The bars cut from the center of the block were much weaker and the fracture showed very coarse grain. The average breaking stress of the bars from the center of the block was 1,750 pounds.

For the third case (also an actual experiment) a fairly strong mixture was employed. Four round test bars 15 inches long, were cast from one ladle of iron. Two of the bars were 1¼ inches in diameter and two were 1⅝ inches diameter, in the rough castings. The 1⅝ inch bars were turned, for a length of 10 inches between shoulders, to a diameter of 1.129 inches, giving an area of one square inch. The 1¼-inch bars were turned, for a length of ten inches between shoulders, to a diameter of .899 inch, giving an area of .635 square inch, the ends being threaded for the grips of the testing machine. The following table, selected from a number of similar tests, will show the great difference in strength per square inch between test bars 1¼ inches and 1⅝ inches diameter, cast from the same ladle of iron.

Test No.	Date.	Rough diam.	Finished diam.	Square inch Area.	Ultimate strength lbs. per sq. in.	REMARKS.
1167	2/27/00	1-⅝"	1.129"	1.000	29300	Fracture Close Grain.
1168	"	1-⅝"	1.129"	1.000	28900	"
1169	"	1-¼"	.899"	.635	33160	"
1170	"	1-¼"	.899"	.635	33200	"

Other similar tests were made corroborating the foregoing. and all tending to show the importance of adopting standard when poured into castings of different dimensions.
sizes of test bars for determining the strength of cast iron

Records of tests of cast iron are useless, for the reasons here given, unless the rough dimensions and finished sizes of the bars are stated. Recently, for example, an excellent paper on "Melting Steel with Cast Iron" was read before the New England Foundrymen's Association, and printed in extenso in many technical periodicals. Records were given of eighteen separate melts of cast iron and steel scrap, with complete chemical analyses of each melt, together with six tensile and transverse tests from each melt, making 108 breaking tests in all, but nowhere could I find any statement showing the dimensions of the test bars, either rough or finished, so that it was impossible to make any use of these records for purposes of comparison. This is by no means an exceptional instance.

The rate of cooling of cast iron from the fluid to the solid state is such an important factor in determining the physical properties of the metal, that it is just as important to know the dimensions of the test bars as it is to know the chemical composition. It is equally desirable, for the same reason, that standard sizes of test bars should be adopted which would be suitable for different grades of iron.

At the present time the whole matter of testing cast iron is in such a chaotic state, that few of the published tests are susceptible of comparison, one with another, or even of affording reliable information regarding the character of the metal. It is with the hope of drawing attention to this important subject that these brief notes are here presented showing a few actual tests that have been made, from time to time, during the past fifteen years.

The Hanging Rock Region.

IRONTON, O., July 27.—The Belfont Iron Works Co. paid a dividend of 10 percent last week, making the second for the year.

The Portsmouth Steel Co. contemplates adding a reversing rolling mill to its plant, for making sheets and plates.

Raymond D. York, of Portsmouth, formerly of the Burgess mill, has been awarded another patent on his series of inventions for the improvement of rolling mills.

The plant of the Norton Iron Works Co., at Ashland, Ky., resumed last week after a suspension of almost two months, due to the Amalgamated strike at the sheet and rod mills. Both the cut and wire nail and the wire-drawing and galvanizing departments are now working in full.

Another strike, based solely on the demand for the reinstatement of men who were discharged for incompetency or laid off on account of slack work, has caused a complete suspension of the Ironton Portland Cement Co. plant. Secretary Bishop, of the state board of arbitration, is here to proffer arbitration, but as the company has had seven strikes in the one year of its operation, no concessions are anticipated. Ejectment proceedings against men occupying company houses have been begun.

An Indianapolis concern manufacturing steel castings desires to come to Ironton if the city will furnish a free site and a bonus of $20,000.

Col. H. A. Marting, president, and J. G. Battelle, vice president, of the Columbus Iron & Steel Co., Columbus, O., are directors of the McDonald Colliery Co., which held its first annual meeting at McDonald, W. Va., last week. The C. & O. is building a seven-mile siding to shaft No. 1, which will be opened by Oct. 1. No coking plant will be built next year.

H. L. Amos, formerly manager of Vesuvius Furnace, is preparing plans for a newly formed company contemplating the erection of a plant in the State of Washington to manufacture Russia iron by a new process. It is said that even with redwood charcoal fuel at $18 a ton, iron can be manufactured at a profit.

In an informal way members of the Amalgamated Association in this city have expressed a willingness to take $35,000 stock in a proposed new rolling mill to be worked up by a local mill manager, if sufficient stock subscriptions among the business men can be secured. It is thought there is a field here for a merchant mill if the Republic Iron & Steel Co. abandons the Eagle plant.

The Foster Stove Co. has suspended operations for ten weeks while it rebuilds its plant in this city, which will be greatly enlarged and modernized.

The Astoria Steel Co., Astoria, New York, expects to be in active operation for the manufacture of steel castings about Oct. 1. The company is equipping the plant with up-to-date apparatus and will have a capacity of 100 tons a day. P. J. Ryan, formerly of the Penn Steel Casting Co., is the sales manager.

Germany's pig iron production for June was 839,541 tons, against 695,073 for the previous month. The production for the half year was 4,882,271 tons, an increase of 868,495. The iron market is weakening.

The Mossberg & Granville Mfg. Co., manufacturer of roller bearing machinery, at Providence, R. I., has filed a statement showing liabilities of $534,924. The assets amount to $61,380.

DESIGNER'S RIGHTS IN BLUE PRINTS AND DRAWINGS.

Judge James R. Macfarlane, of the common pleas court, sitting at Pittsburg, handed down his decision last week in the suit between the Pressed Steel Car Co. and the Standard Steel Car Co., whose plant is located at Butler, Pa. Suit was brought to recover blue prints and dies used in the manufacture of steel cars, and said to have come into the possession of the defendant through employes of the plaintiff who secured employment with the Standard Steel Car Co. upon its formation. The court decided adversely to the Standard and directed the return of all blue prints and dies belonging to the Pressed Steel Car Co. The decision is one of great importance as defining the rights of employes to aid a competing concern as it is alleged was done in this instance. Other suits entered by the Pressed Steel Car Co. against the Standard Steel Car Co. call for damages to the amount of $1,000,000. Among others named in the bill of complaint is John M. Hansen, formerly employed by the Pressed Steel Car Co., as chief engineer and who was instrumental in the organization of the Standard Steel Car Co. and also became its president.

The defendant company has had in its possession a great number of blue prints and drawings, showing cars and car parts, and it has also a large number of blue prints made by different railroad companies from tracings or drawings made by these companies from blue prints furnished them by the Pressed Steel Car Co. The latter prints are termed secondary prints, and are in most particulars reproductions of the plaintiff's prints.

The plaintiff company in its bill alleged that certain of the prints in question had been removed by Hansen, but as to these particular prints, Judge Macfarlane says:

"The defendant company never received nor had in its possession and the defendant Hansen did not nor did any of the other defendants at any time have in their possession any die, prints or blue prints showing the essential features of dies used by the plaintiff except that some such drawings were in the possession of the defendant Hansen when he was an officer of the plaintiff company, but no such prints were removed by him or any of the other defendants from the plaintiff's premises. The defendant Culverhouse, as admitted by his answer, ordered and had delivered to him, just prior to his leaving plaintiff's employment, certain blue prints of bills of material of the plaintiff company which remained in his personal possession until they were produced in court and placed in the custody of the prothonotary. These prints were so procured and retained by the said Culverhouse without the knowledge or connivance of any of the other defendants. These prints are the property of the plaintiff company. None of the blue prints, originals or copies, were procured by the defendant or any of them, from the plaintiff company, but the originals has been sent by that company to railroad companies and one individual. * * * There was no express limitation on the part of the plaintiff company as to the use to which these prints should be put and no expressed restriction placed upon the ownership. The purpose was, however, understood by all parties."

Judge Macfarlane cites other instances where the plaintiff company allowed copies of its prints to go to third parties and from them copies were secured by the defendant company, and says that these prints are of great value to the plaintiff company and that their possession by others will work great damage to the plaintiff.

After citing the contentions of the parties and especially that of the plaintiff to the effect that there was no express agreement that the prints were not to be used to their detriment by the people into whose possession they fell in the course of business, but that they were to be used in good faith and not to the damage of the plaintiff, Judge Macfarlane says: "The industry of counsel and our own examination have failed to find any decisions of any Pennsylvania courts ruling this proposition. In a great manufacturing community like ours this, or a similar situation, frequently arises. An engineering and contracting concern negotiating for the erection of a furnace or large steel plant sends to the proposed customer blue prints of drawings which are the results of years of study and experience and have been produced at large expense; and an offer is made to construct the plant at a certain price. The purchaser sends either the prints or copies of them to a competing contractor and solicits his bid, thus giving him the benefit of the skill, experience and pecuniary outlay of the other. Or the rival solicits the loan of the blue prints for its own information or for its uses in bidding against the one whose designs are acceptable.

"This case, however, affords an excellent illustration. The chief engineer of the Pressed Steel Car Co. promotes a company to enter into competition with his employer. Immediately upon the formation of the new concern a large number of employes in various departments of the old leave and enter the employment of the new. They bring with them, as is their unbounded right, the skill and experience as gained while working for the pioneer company. This would enable the new company to avoid many of the expensive experiments and mistakes of the old, and these engineers and draftsmen, with their knowledge of the construction of the cars and of the method of manufacture, according to their own testimony, should have been able to measure the cars made by the company and produce in a short time detailed and practical drawings from which the cars can be constructed. They did not do this for the very obvious reason that blue prints of drawings were available and were accurate. It is idle to say that these drawings are of no value or of little value. The railroads to whom the Pressed Steel Car Co. has furnished cars sent the blue prints furnished to them to the new company, naturally welcoming the advent of competition likely to reduce the prices; or some complacent subordinate, or even head of a department, assists the new company to obtain the results of the experiments of the old in a shape, that, at a glance, conveys more information to an engineer and particularly the engineer who makes the drawings, than would the reading of a descriptive book or the examination and measurement of many cars. This may be 'good business,' but the element of unfairness in the transaction forcibly strikes the mind. * * A certain amount of publicity is unavoidable in any manufactory, but an unlocked door is not an invitation to the passerby or to the servant of the household to help himself. Neither does the manufacturer abandon his property in a design by delivering it or a copy to another for a restricted purpose, nor by a limited publication. His property rights will be protected in such cases and he will be protected against a breach of trust, confidence or contract, and especially will he be protected against a breach of confidence existing between employer and employe. These principles are supported by a number of well considered cases.

"It is hardly necessary to cite authority for deciding that the bills of material must be retained to the plaintiff under the facts found. The excuse for taking them was that it was customary for draftsmen to make blue prints for their own work and retain them for their own use. If there be such a practice it is a reprehensible one. The principles underlying these cases have, however, a bearing upon the question of the other prints, viz.: a breach of the confidence necessarily arises out of the relation between the parties, that relation raising an implied contract. Broadly stated, it is that a court of equity will not permit any one to take an unfair advantage of a position in which he has been placed through any relation of confidence and trust, or we think, through the necessities of, or as incident to a contract. * * * When the Pressed Steel Car Co. permitted its customers to have blue prints, it did not give them the right to a use which was not in the contemplation of both parties and which would give an unfair advantage to a competitor." Judge Macfarlane's conclusions of law are as follows:

"First—The defendant, the Standard Steel Car Co., is not entitled to the possession of the original blue prints of the Pressed Steel Car Co.'s cars and car plants, and must deliver them to the plaintiff.

"Second—The blue prints of bills of material now in the hands of the prothonotary are to be returned to the plaintiff.

"Third—All copies or tracings of drawings or of blue prints of drawings of the Pressed Steel Car Co. are to be delivered to the plaintiff, whether the said copies have been made by the defendants or by third parties. For the purpose of identifying these copies and of ascertaining the necessary facts there should be a reference to an expert or examiner, unless the parties can agree to some other method of ascertaining the facts.

"Let a decree be drawn in accordance with the foregoing and enjoining the defendants from using any of the blue prints or copies thereof. The defendant, the Standard Steel Car Co., to pay the costs."

NEW GRINDING ATTACHMENTS.

Some novel forms of grinding attachments are made by L. S. Heald & Son of Barre, Mass. The machines are made for friction or motor drives, the former type being driven from a friction roll running on the largest step of the cone pulley—an arrangement which leaves the lathe centers free to hold the work. The power is transmitted to the grinding spindle through a universal joint and pair of bevel gears, one of the gears being made of fibre in order to maintain quiet running even at the high speeds requisite for satisfactory work. The speed of the grinding wheel can be readily changed by moving the lathe belt from one step of the cone to another and the friction roll is mounted on a stem pivoted in a clamp which fastens to the ways of the lathe. It will be understood that the large gear on the lathe spindle can be released from the cone by moving the screw as when engaging the backgears, and in this way—the large gear and the cone being independent—the work can be held on dead centers. A rod attached to the pivot stem supporting the friction wheel extends upward and engages the teeth of the large gear and holds it against rotation. This stop can be turned out of the way when the work is required to rotate as in internal and face grinding.

One of the electrically driven grinders is illustrated in Fig. 1 and is designed for tool post use, not only on a lathe but on planers, shapers and milling machines as well. The machine has an independent feed of over 3 inches by worm and hand wheel so that it may be conveniently used in lathes which do

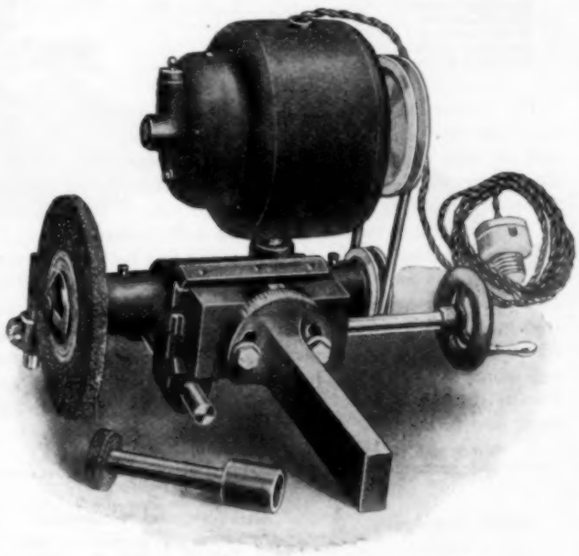


FIG. 1.—MOTOR-DRIVEN GRINDING ATTACHMENT.

not have a compound rest as it can be set to any angle for grinding straight or taper work. The attachment has a gauge or work rest which is adjustable in all directions; this feature is somewhat hidden by the emery wheel in Fig. 1 but is seen to better advantage in Fig. 2. An extension spindle is also provided for internal grinding. The bearings for the main spindle are made of bronze and are adjustable for wear and well protected from the entrance of grit or dirt.

A feature of interest is the arrangement of the motor above the grinding spindle. Small wheels must rotate at high speeds to do good work, while large ones may be run proportionately slower and this is not easily done when the wheel is mounted directly on the motor shaft. The design adopted enables the motor to be run at an efficient speed and to use a standard type which is easily repaired. This construction also permits the choice of motors for alternating as well as direct current; the former run at moderate speeds and hence are not suitable for direct mounting of grinding wheels on the motor shaft.

The shank of the machine is graduated at the connection as shown in Fig. 1 and the attachment can thus be rotated to different angles in a vertical plane. Fig. 2 illustrates the machine at work sharpening a milling machine cutter, the cutter being sharpened in position.

Fig. 3 shows a portable hand grinder for finishing castings preliminary to painting, etc., or in the erection of machinery, where it is inconvenient to bring the work to the wheel. The wheel seen in the engraving is 6 inches diameter by ⅜-inch thick, but various styles can, of course, be employed on different kinds of work. The motor is of the enclosed type and for these portable hand grinders is furnished for direct current only and for any voltage not exceeding 250.

Observing the Motion of High Speed Machine Parts.

In dealing with slowly-moving mechanism, it is easy to determine by observation the exact motion of the different elements constituting the machine. At high speeds this is less easy, and where cams are made use of for actuating cer-

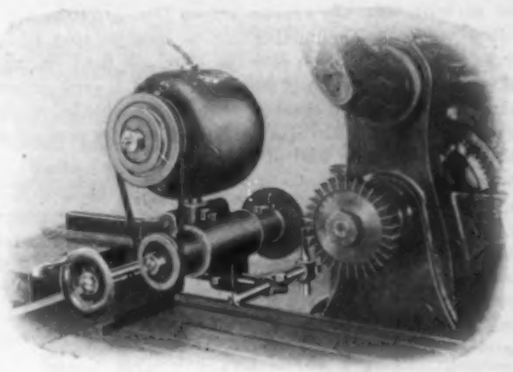


FIG. 2.—SHARPENING CUTTER IN PLACE ON MILLING MACHINE.

tain parts, it is impossible to find out what happens at high speeds from observations made at low ones, since the inertia effects only become of importance when the speed is great. A method of observing the motions of rapidly-moving parts, such as, for instance, the opening and closing of the exhaust valve motion of a high-speed petrol motor was decribed by Prof. Hospitalier at a recent meeting of the Paris Society of Civil Engineers and is given in *Engineering*. In principle the plan consists in illuminating the valve motion in question by flashes of intermittent light. If these flashes occur regularly at every cycle of the motor the valve gear will appear quite stationary, whilst if the periodicity of the flashes is slightly decreased, the motion will appear to run through its complete

FIG. 3.—PORTABLE HAND GRINDER.

cycle, but at a very slow speed, and in so doing every vibration it makes will be clearly observable. An instrument specially designed for researches of the kind in question has been constructed for M. Hospitalier by MM. Malicet and Blin, of Paris.

The annual meeting of the Janesville Machine Co., Janesville, Wis., was held recently. Reports for the year show a gratifying condition of business. The following officers were elected: A. P. Lovejoy, president; Hiram Merrill, vice president; W. F. Bosworth, secretary; J. A. Craig, general manager; John G. Rexford, treasurer; S. C. Cobb, superintendent.

Pig Iron Production, First Half of 1903.

The American Iron and Steel Association has collected from the manufacturers and published complete statistics of the production of all kinds of pig iron in the United States in the first half of 1903; also complete statistics of the stocks of pig iron which were on hand and for sale on June 30, 1903. The production of pig iron in the first half of 1903 was 9,707,367 gross tons, against 8,808,574 tons in the first half of 1902 and 9,012,733 tons in the second half of 1902.. The increase in production in the first half of 1903 over the second half of 1902 was 694,634 tons. The united production of the second half of 1902 and the first half of 1903 amounted to 18,720,100 tons. The whole number of furnaces in blast on June 30, 1903, was 320, against 307 on Dec. 31, 1902, and 286 on June 30, 1902. The number idle on June 30, 1903, was 101. Of the active furnaces on June 30, 1903, 226 used bituminous fuel, 53 used anthracite coal and coke mixed, 4 used anthracite coal alone, and 37 used charcoal alone. The table below shows the number of active furnaces on June 30 and the production in each State in the first half of this year.

TOTAL PRODUCTION OF PIG IRON

States.	Blast Furnaces. In Blast Dec. 31, 1902	Blast Furnaces. June 30, 1903. In.	Out.	Total	Production. Gross tons of 2,240 lbs. (Includes Spiegeleisen.) First Half of 1902.	Second Half of 1902.	First half of 1903.
Massachusetts	1	1	1	2	1,716	1 644	1,419
Connecticut	2	2	1	3	5,278	6,808	7,142
New York	10	12	8	20	186,523	214,84(	270,443
New Jersey	6	6	5	11	105,295	86,085	106 387
Pennsylvania	116	125	27	152	4,045,965	4,071,835	4,498,038
Maryland	4	4	2	6	148,619	154 610	166,801
Virginia	19	19	8	27	263,233	273,983	322,529
North Carolina	.....	1	1	2	12,401	19,914	34,001
Georgia	3	4	1	5			
Alabama	39	34	12	46	700,546	771,665	777,870
Texas	1	1	3	4	1,528	1,567	5,023
West Virginia	3	3	1	4	93,297	89,708	106 970
Kentucky	5	4	4	8	51,089	59,636	53,034
Tennessee	16	15	8	23	187,359	205,419	227,259
Ohio	47	49	12	61	1,775,496	1,855,892	1,860,334
Illinois	15	17	3	20	879,800	850,420	838, 55
Michigan	7	10	1	11	85,661	69,552	111,953
Wisconsin	6	6	.....	6	131,531	142,456	157,241
Minnesota	1	1	.....	1			
Missouri	2	2	.....	2			
Colorado	3	4	1	5	133,237	136 693	162,268
Oregon	.....	.....	1	1			
Washington	1	.....	1	1			
Total	307	320	101	412	8,808,574	9.012.733	9 707,367

The production of bituminous coal and coke pig iron in the first six months of 1903 amounted to 8,401,001 gross tons, of anthracite and coke mixed to 1,046,461 tons, of anthracite alone to 26,261 tons. The production of charcoal pig iron in the first half of 1903 was 232,717 gross tons, against 186,098 tons in the first half of 1902 and 192,406 tons in the second half of 1902. In addition there were produced in Wisconsin and Washington in the first six months of this year 927 tons of pig iron with mixed charcoal and coke.

The production of spiegeleisen and ferromanganese in the first half of 1903 was 110,675 gross tons, against 118,982 tons in the first half of 1902 and 93,999 tons in the second half of 1902.

Production according to fuel in the half year and the two preceding half years, and unsold stocks on June 30, 1903, Dec. 31, 1902, and June 30, 1902, are shown in the table below:

UNSOLD STOCKS AND PRODUCTION ACCORDING TO FUEL.

Fuel.	Stocks Unsold. Gross tons of 2 240 lbs. Dec. 31, 1901.	June 30, 1902.	Dec. 31, 1902.	June 30, 1903	Production Gross tons of 2,240 lbs. (Includes Spiegeleisen). First half of 1902.	Second half of 1902.	First half of 1903.
Bitumin'us	42,426	21,621	38 643	97,694	7,882,731	8,433,159	8,401,001
Anthracite.	12,007	4,715	4,080	15.673	733,746	381,507	1,072,722
Charcoal	15 950	3,525	7,226	12.934	186,098	192,406	232.717
Charcoal and coke	264	.....	.....	.....	6,004	5,661	927
Total	70,647	29,861	46 951	126,301	8,808,574	9.012,733	9 707 367

The statistics of unsold stocks do not include pig iron sold and not removed from the furnace bank, or pig iron manufactured by rolling mill owners for their own use, or pig iron in the hands of consumers. The stocks which were unsold in the hands of manufacturers or their agents on June 30, 1903, as shown in the above table, amounted to 126,301 tons, against 49,951 tons on Dec. 31, 1902, and 30,861 tons on June 30, 1902, the latter figures including 1,000 tons in the yards of the American Pig Iron Storage Warrant Co., which the manufacturers did not control. No pig iron was stored in the yards of this company on June 30, 1903, or on Dec. 31, 1902. The distribution of unsold stocks at the end of the last four half-year periods is shown below by States and in the case of Pennsylvania and Ohio by districts:

TOTAL STOCKS OF UNSOLD PIG IRON.

States.	Gross Tons of 2,240 Lbs. Dec. 31, 1901.	June 30, 1902.	Dec. 31, 1902.	June 30, 1903.
Massachusetts and Conn	684	463	229	477
New York	4,907	772	2,661	4,895
New Jersey	648	241	700	2 100
Pennsylvania	20,750	9,279	5,122	24,413
Maryland	8,477	5,267	6,791	16,736
Virginia				
North Carolina, Ga., and Texas	1,066	.....	.....	2,416
Alabama	4,393	5,947	22 404	30,619
Kentucky and We-t Va.	3 156	1,589	1,125	5,316
Tennessee	1,361	1,559	3.554	11 408
Ohio	18,299	1,303	4.457	20,073
Michigan and Minnesota	6,906	3.441	2,908	7,828
Illinois and W sconsin				
Missouri and Colorado				
Pacific States				
Total	70,647	29,861	49.951	126 301

STOCKS OF PIG IRON IN PENNSYLVANIA AND OHIO.

Pennsylvania.	Lehigh Valley	3,783	2,094	1 0	6,741
	Schuylkill Valley	4.756	1 076	400	1,034
	Upper Susquehanna Valley	1,409	1,182	2,256	3 941
	Lower Susquehanna Valley				
	Juniata Valley	600	3,110	1,598	5 263
	Allegheny County	.....	.....	.....	500
	Shenango Valley	4,017	890	.....	3,610
	Miscellaneous bituminous	3,139	338	.....	2,754
	Charcoal	3 046	589	718	570
Ohio.	Mahoning Valley bitum	8,343	364	2,503	7,348
	Hocking Valley "	.....	300	.....	.....
	Lake Counties "	1,671	.....	.....	905
	Miscellaneous "	.....	.....	.....	.....
	Hanging Rock "	5,703	389	865	11,107
	Hanging Rock charcoal	2,582	250	1,089	713

The production of Bessemer iron in the first half of 1903 was 5,480,619 gross tons, against 5,105,932 tons in the first half of 1902 and 5,287,236 tons in the second half of 1902. The figures for the first half of 1903 include 89,723 tons of low-phosphorus pig iron, against 81,818 tons in the first half of 1902 and 82,428 tons in the second half of that year.

The production of basic pig iron in the first half of 1903 was 1,203,803 gross tons, against 1,053,274 tons in the first half of 1902 and 985,316 tons in the second half of 1902. Basic pig iron made with charcoal is not included in these figures. The tables below show the production of Besesmer iron in the past six months, and in the first half of 1902 by States, and in Pennsylvania and Ohio by districts; also the production of basic iron in the same periods:

PRODUCTION OF BESSEMER AND LOW-PHOSPHORUS PIG IRON.

States	Production Gross Tons of 2,240 Lbs. (Includes Spiegeleisen). First half of 1902.	Second half of 1902.	First half of 1903
New York	17,983	48,698	39 112
New Jersey			
Pennsylvania	2,579.439	2,550 183	2 784,209
Maryland	144,750	152,221	168,137
Virginia and Alabama	.....	.....	3 299
West Virginia	93,297	89 640	106,970
Kentucky and Tennessee	2,855	6,891	9,615
Ohio	1,372 209	1,555,396	1,459,443
Illinois	752 989	742,309	710,199
Michigan, Wisconsin, and Minnesota	38,349	43,979	75,096
Missouri and Colorado	104,061	97,519	128,539
T tal	5,105,932	5,287,236	5,480,619

PRODUCTION OF BESSEMER AND LOW-PHOSPHORUS PIG IRON IN PENNSYLVANIA AND OHIO.

Pennsylvania.	Lehigh Valley	77,386	38,229	37,722
	Schuylkill Valley	30,902	23,318	37,071
	Upper Susquehanna Valley	3,147	.....	.....
	Lower Susquehanna Valley	225,696	178,960	187,902
	Juniata Valley			
	Allegheny County	1,551,847	1,571,785	1,738,122
	Shenango Valley	434,597	457,179	486,722
	Miscellaneous bituminous	255 864	281 112	295,870
Ohio.	Mahoning Valley	561,958	531,277	525,965
	Hocking Valley	.....	.....	.....
	Lake Counties	344,117	474,990	436105
	Hanging Rock bituminous	52,568	60,035	52 830
	Miscellaneous bituminous	413,559	489,094	444,543

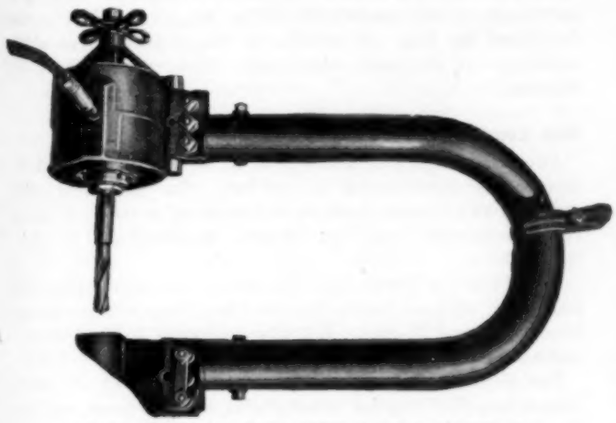
PRODUCTION OF BASIC PIG IRON, NOT INCLUDING CHARCOAL IRON.

New York and New Jersey	50,994	39,742	74,828
Pennsylvania—Allegheny County	443 901	488 631	436,970
Pennsylvania—Other counties	304,633	291,583	439,341
Virginia and Alabama, and Tennessee	179 974	115,217	153,861
Ohio and Missouri	73,772	50,143	108,903
Total	1,053,274	985,316	1,203,803

BOYER PISTON AIR DRILL.

The illustration shows the Boyer piston air drill with a yoke attachment. This arrangement enables the workman to drill in any position conveniently and thereby greatly increases the range of the tool. The hanging of the tool by a bail adds to the general handiness as intimated, but there is also an added accuracy in the drilling itself because of the firm support. The device is among the recent additions to the scope and effectiveness of the air drills and riveters made by the Chicago Pneumatic Tool Co., of Chicago.

The Boyer drill, as shown in the engraving, consists of three parts: The upper housing, into which the throttle valve and the steadying lever are screwed, and which forms a live air chamber, carrying the motor; the diaphragm, which forms the lid or cover of the upper housing, and through which the hollow exhaust spindle projects; the lower housing, secured to the upper housing by means of screws, and containing the gear wheel rack bearings for the drills, spindles, etc. The motor is a three-cylinder, single-acting, oscillating engine, the cylinders being carried in the rotary frame. This frame consists of an upper and a lower plate and is triangular and free to rotate around its center on two bearings, the lower one being a hollow shaft connected by gearing to an internally toothed wheel in the lower half of the casing. The admission of air to the cylinder is regulated by the valves formed in the pivots upon which the cylinders oscillate. The cylinders are single acting and the inner ends are open; therefore, air pressure in the upper casing has free access to the pistons on that side. It might be assumed that the air being admitted through the pivot valves would only produce equilibrium, but one of the cylinders being always open to the exhaust through the hollow bearing of the triangular frame, this equilibrium is disturbed and the compressed air becomes effective upon each piston as the valves come in line with the exhaust.



BOYER PISTON AIR DRILL WITH YOKE ATTACHMENT.

The cylinders are made of steel tubes and are fitted with trunk pistons having their connecting rod ends coupled to a common crankpin which is fixed. These drills are fitted with a regulator by which the power and the speed can be varied as desired.

John F. Allen, 370-372 Gerard Ave., New York City, reports the following shipments of Allen riveting machines for the month of June: Westinghouse Electric & Mfg. Co., Pittsburg, 2 machines; Jones & Laughlin Steel Co., Pittsburg, 2; Decatur Bridge Co., Decatur, Ill.; U. Baird Machinery Co., Pittsburg; Manning, Maxwell & Moore, New York City, 2; New Jersey Bridge Co., Perth Amboy, N. J.; Wellman-Seaver-Morgan Co., Cleveland; Chas. F. Ernst, Buffalo; Skobis Bros., Milwaukee, Wis.; Canadian Bridge Co., Walkerville, Ont. Total, 14 machines.

The American Seeding Machine Co. has declared a quarterly dividend of 1¾ percent on its preferred stock after being in business since March 15. The net earnings have been $203,000, and it has quick assets of $1,300,000 in excess of its liabilities. This is a recent combination of agricultural implement makers, with headquarters at Springfield, O.

EASTERN PENNSYLVANIA.

HARRISBURG, July 28.—The Central Iron & Steel Co. is preparing to take hot metal from its Paxton furnaces and the open-hearth department now in course of erection. The open-hearth plant will be started about the end of the year with four furnaces. In the meantime No. 1 furnace, which has been in blast for three years, will be overhauled. The company is rebuilding its 89-inch mill, recently burned.

The Pennsylvania Steel Co. has more men than ever on its payrolls at its Steelton works. The June rolls aggregated 8,600 names and the July list will probably foot up close to 9,000.

The Reading Iron Co. has started up its sheet mill at Reading after a considerable idleness.

W. E. Mumford, formerly superintendent of the Norway Iron & Steel Co., of York, has been made superintendent of the Berwick Malleable Iron Works at Berwick. The plant is being enlarged.

The State of Pennsylvania has bought the better part of the old charcoal forest of the Logan Iron & Steel Co. in the Juniata Valley, paying $21,000 for 8,600 acres. This tract formerly supplied wood for running the company's Emma and Greenwood furnaces, near Lewistown, and will be preserved by the State as a forestry reservation. This is the second iron company forest bought within a year by the commonwealth, the last one being the famous furnace property at Mont Alto.

The Prizer-Painter Stove Co., of Reading, has just taken an order calling for several hot air furnaces for Tien-Tsin, China.

The Pennsylvania Agricultural Works, of York, is increasing shipments to South America. Some machines have lately gone to Argentine ports.

H. F. Mann has resigned as superintendent of the American Ax & Tool Co.'s plant at Mann's Narrows.

There is talk of formation of a new chain company at Lancaster. Philadelphia capitalists have been going over sites.

The Reading Foundry Co. has been compelled to erect additional buildings and may make extensions this fall if trade is maintained. The Exeter Iron & Steel Co., a neighbor plant, is now running two shifts on charcoal iron products. It occupies the old Diamond Drill Works site.

Temple furnace of the Reading Iron Co. has been blown out for relining. The furnace had been in blast for some time and had made a splendid output. One of the Empire furnaces in the Reading district is also idle.

Affairs are promising in the Lehigh Valley in spite of the financial conditions which involve some of the works in that district. Almost all of the furnaces are in operation and the rolling mills have been kept going. Bethlehem and Allentown works are making some notable shipments from the yards, the deliveries of armor by Bethlehem so far this month having been heavy.

Labor troubles appear to be over in the Cumberland Valley. The Landis Tool Co. and the Frick Co., two Waynesboro concerns, have lately been making strong bids for foreign trade. Engines have been sent to Manila and South Africa.

The Mt. Pleasant Tool Co. has been granted a State charter and will manufacture tools. The capital is $75,000 and the directors are J. M. Rowland, C. E. Mullin, W. A. Klap, E. Warden, J. W. Shupe and F. D. Barnhart, of Mt. Pleasant.

The Standard Steel Co. is rebuilding that portion of its Burnham works damaged by fire this month.

The Lorraine Foundry Co., Baltimore, Md., recently incorporated, was organized for the purpose of carrying on the business formerly conducted by the Diven Deved Foundry Co. There is no connection, however, between the two companies, nor are any of the persons interested in the new company who were in the old. D. S. Hawkins is president of the Lorraine Foundry Co., and F. A. Lazenby is treasurer and general manager. These two officers together with Mr. Wm. Cochran, Jr., E. A. Robinson and W. E. Williams form the board of directors. The company's building is well equipped and has facilities for handling work up to 20 tons.

The Red River Furnace Co., of Clarksville, Tenn., will be put in blast about Aug. 1. It has been out about 60 days for repairs.

INDUSTRIAL SUMMARY.

[If you are in need of machinery of any description, please notify *The Iron Trade Review*, and we will put you in communication with our advertisers at once.]

New Buyers in the Market and Some of Their Wants:—

The Jenkins Mfg. Co., 46 Farrand St., Bloomfield, N. J., has been incorporated with a capital of $25,000, to manufacture and sell articles made of metal.

The Puget Sound Machinery Depot, Seattle, Wash., has increased its capital stock from $100,000 to $125,000. The company has a surplus of $235,558.48.

The Heffernan Engine Works, Seattle, Wash., has been incorporated with a capital of $50,000, to build engines and other machinery.

The Carlson Dixon Gas Engine Mfg. Co., of Guthrie, Oklahoma, has been incorporated with a capital of $15,000.

The Stimpson Standard Scale Co., Detroit, Mich., has increased its capital stock from $60,000 to $75,000.

The Hanna Engineering Works, Chicago, $150,000 capital, has been incorporated to manufacture machinery.

The Boehm Stove & Repair Co., Milwaukee, has been incorporated with a capital stock of $10,000.

The Michigan Pencil Machine Co., Detroit, capital $25,000, has been incorporated.

The Safford Stamp Works, 1455 60th St., Brooklyn, N. Y., has been incorporated with a capital of $5,000.

The new loom company, at Worcester, Mass., consisting of Edward D. Thayer, Jr.; George Crompton, Randolph Crompton and William B. Scofield, is in the market for machine tools.

The W. R. Colcord Machinery Co., St. Louis, Mo., has been organized with a paid up capital of $20,000, to succeed the company of the same name formerly owned by W. R. Colcord. The concern manufactures metal working machinery and machine shop equipment.

The Oregonia Bridge Co., of Oregonia, O., has been reorganized and was incorporated under the laws of Delaware on July 15, as the Oregonia Bridge Co., of Lebanon, O., capital stock $50,000. There have been issued also $10,000 of bonds. The plant and office of the company will be removed from Oregonia, O., to Lebanon, O., about Oct. 1. The company is constructing a new building of brick and steel 200x75 feet, one story, and arrangements are being made to equip the plant with new machinery. A 35 to 40-h. p. gasoline engine, a punch and shear, lathes, emery wheels, riveting machines, traveling crane and entire new shop equipment will be purchased. The officers of the company are John Bradbury, president; C. A. Spencer, vice president; P. R. Spencer, treasurer and general manager; H. W. Ivins, secretary. The company manufactures iron and steel bridge work, fire escapes, etc.

As a result of the final meeting of the citizens of Findlay, O., and the energetic canvass by the representative business men of the city, it is announced that the United States foundry will soon commence operations in that city.

The Smith's Falls Malleable Casting Co., Ltd., Toronto, Ont., with a capital of $150,000, has been incorporated to take over the business of the Smith's Falls malleable iron works.

The Michigan Bolt & Nut Works, Detroit, has increased its capital stock from $200,000 to $300,000.

The Sheet Metal Specialty Mfg. Co., of Detroit, has been organized with $30,000 capital.

The Solomon Machine Co., Philadelphia, has been incorporated with a capital of $30,000.

The American Drying Machinery Co., Pittsburg., has been incorporated with a capital of $50,000.

The Mine & Mill Supply Co., Chicago, capital $10,000, has been incorporated to manufacture and deal in machinery, equipment and supplies.

The Dames-Marheuser General Steel and Iron Works, St. Louis, has been incorporated to manufacture machinery and tools, by Wm. J. Dames, Joseph Marheuser and M. M. Priver; capital $2,100.

W. A. Deans' Sons, Goldsboro, N. C., want 20-horsepower return tubular boiler.

J. L. Huson, Covington, Ga., is in market for second-hand return tubular boiler, 50 horsepower.

Henry B. F. Macfarland, Henry L. West and John Biddle, commissioners, Washington, D. C., will receive sealed proposals until Aug. 15 for furnishing one steel water tank of 85,000 gallons capacity.

Charleston Boiler & Foundry Co., Charleston, W. Va., is in market for bolt-threading machine.

J. J. Farrell, president and general manager, Kansas City, Brinkley & Helena Railway Co., Brinklev Ark., is in market for rails and supplies.

Piedmont College, Lynchburg, Va., will contract for mechanical equipment.

Fires and Accidents:—

Fire in the plant of the J. I. Case Machine Co., Racine, Wis., July 22, partly destroyed the plant, causing a loss of about $30,000.

Fire in the plant of the Bollman-Wilson Foundry Co., Cincinnati, July 17, caused a loss of $5,000. Work was stopped only one day. Repairs have been made and the plant is now running with full force.

A disastrous fire visited Louisville, Ky., July 21. Among those who sustained losses was the Follansbee Bros. Co., manufacturer of sheet iron and metal, whose plant was damaged to the amount of $15,000.

The foundry and machine shops of Wm. Taylor, at Obion, Tenn., were destroyed by fire July 22; origin unknown. There was $3,000 insurance, which partly covers the loss.

The Southern Foundry and Machine Co.'s plant, at Knoxville, Tenn., was destroyed, July 24, by a blaze which started in a working room. The total loss is $60,000, with $34,000 insurance.

On Saturday night, July 25, the bolt, forge and axle departments of the Cambria Steel Co., Johnstown, Pa., were destroyed by fire. A portion of the 20-inch plate mill building was also badly damaged. The estimated loss is $150,000.

New Construction:—

The Sizer Forge Co., Buffalo, N. Y., will erect a new addition of steel construction, 96x100 feet. The equipment will include a 12-ton steam hammer and a 30-ton electric traveling crane, purchased from the Morgan Engineering Co., Alliance, O.

The Titusville Forge Co., Titusville, Pa., is enlarging its blacksmith shop to 50x100 feet, and is adding a large steam hammer, several jib cranes and other equipment to the foundry and machine shop.

The Keystone Foundry & Machine Co., Lebanon, Pa., will erect a large building for nickel plating machine parts and for the storage of bicycles manufactured by the company.

The Bair & Gazzam Mfg. Co., Pittsburg, has been compelled to vacate its present location on account of the entry of the Wabash Railroad into Pittsburg. The company has increased its capital stock from $100,000 to $300,000, and is having plans prepared for a new building 120 feet square and 4 stories high, to be erected on the property recently purchased at 29th and Smallman Sts., Pittsburg. A large and modern machine plant will be operated. H. C. Bair and H. P. Gazzam began business together about twenty years ago, and since that time their plant has been three times enlarged to meet the demands of their business. The new plant will be equipped with gas engines and all machinery will be electrically driven. A limited amount of new stock is to be issued.

President Hutchinson, of the Mexican Car & Foundry Co. of Mexico, has been notified that the government has approved all the plans presented by the company for proposed buildings and machinery. Active work will commence at once, and $1,000,000 will be expended.

At a recent meeting of the directors of the Girard Foundry & Machine Co., Youngstown., it was decided to make extensive additions to the plant. The following officers were elected: President, E. Hartzell; secretary and treasurer, G. M. Gundy; vice president, E. H. Lotze; manager, James Cooper; executive committee, D. B. Harris, W. J. Wallis and G. J. Jones.

The Giddings & Lewis Mfg. Co., Fond du Lac., Wis., is building an addition to its foundry.

The Ajax Metal Co., Richmond St. and Frankford Ave., Philadelphia, will erect a foundry 80x138 feet, at a cost of $23,000.

The Valley Iron Co., Bay City, Mich., has begun the con-

struction of a new building 60x74 feet, which will be used as a foundry.

The Chicago Great Western Railway will expend $200,000 in improvements in Oelwein, Iowa, this year. The work to be done includes the new yards, turn tables and round house and perhaps two buildings to be added to the shops.

The Morse Twist Drill & Machinery Co., New Bedford, Mass., will erect two additions to its plant.

The Portland Iron & Steel Co., Portland, Me., has commenced to rebuild the mill at Legonia, South Portland, destroyed by fire last August. The new buildings will be of fire proof construction, and will cover an area of about 50,000 square feet. W. C. Cutler, formerly of the Bethlehem Steel Co., has been secured as general manager. He expects to have the mills in operation in the fall of this year.

J. B. & J. M. Cornell, 29 E. 37th St., New York, will build a foundry at a cost of $2,500.

Harris H. Uris, New York, has purchased a site and will build a manufacturing building for his ornamental iron business, in that city.

The Denver Steel Casting Co., Denver, Col., has been incorporated with a capital of $500,000, and will soon begin the erection of a large plant.

The Wire & Cable Co., Ltd., Montreal, has purchased a site and will erect a large plant.

The contract for the plant which the Hurwood Manufacturing Co., maker of hardware novelties and the Hurwood tools, is to build in Bridgeport, Conn., has been awarded to the H. Wales Lines Co., of Meriden. The main building will be 42 by 100 feet and four stories high. There will be also an ell, 42 by 66, in which will be installed the forging department. The company is now located at Plantsville, and will move to Bridgeport as soon as the new plant is completed.

The National Steel Foundry Co., New Haven, Conn., which was recently organized, has acquired a large tract of land. A plant will shortly be erected consisting of three buildings, whose dimensions will be approximately 60 by 450 feet and which will cost nearly $100,000. It is expected to commence manufacturing early in 1904 and 300 workmen will be employed. The officers of the company are: President, Henry L. Hotchkiss; secretary, Eugene Buckman; treasurer, H. Stuart Hotchkiss, and general manager, Miribeau Simms. The new corporation will have close business relations with the National Steel & Wire Co.

The Excelsior Foundry Co. advises us that it is its intention to move its plant to a new location in Bay City, Mich., as soon as plans can be drawn and material secured. The company will erect a new foundry, the main building of which will be about 75x200, with electric cranes and power throughout; will make a specialty of heavy jobbing work, being equipped to furnish any casting, green sand or loam work, up to 40 tons weight; will make new plant as near fire proof as possible, and intends to have a modern foundry in every way.

The Frank C. Patten Co., manufacturer of argicultural implements, at Syracuse, Ill., is building a foundry, 200x70 feet, which will be equipped with all the newest devices for the saving of labor and for greatest efficiency of work.

Plans have ben completed for a new foundry building for the Wallace Barnes Co., of Bristol, Conn. The dimensions will be 65 by 140 feet, and the structure will be one story high and of mill construction. The plant will be used for a hardening shop.

Wilcox, Crittenden & Co., of Middletown, Conn., manufacturers of marine hardware, have awarded a contract for an addition to their tinning mill.

The Southern Car Co., High Point, N. C., has its plant for the manufacturing of electric trolley cars well under way, having organized the Southern Car Co. with capital of $250,000 for the purpose of manufacturing all styles of electric passenger, express and freight cars and their equipments. The company is building its plant for a capacity of 350 cars per year, and will commence manufacturing in the early fall.

Work has begun on two of the additional buildings which the Eaton, Cole & Burnham Co., of Bridgeport, Conn., is to erect. One will be 113 by 321 feet and will be used for casting, cleaning, rough storage, pattern and carpenter shop. The other will be 201 by 353 feet, and is to be used for a machine shop.

Foundations are now being put in for the buildings which will be occupied by the United Shoe Machinery Co., at Beverly, Mass. The contract calls for an outlay of $750,000, and it will be fully a year before the plant will be completed. The buildings contain about 10 acres of floor space. About 1,400 employes will be employed.

Work will be started shortly on a new machine shop for the Philadelphia Rapid Transit Co., at Schuylkill Ave. and Christian St., Philadelphia, which will be 52x238 feet, and will cost $20,000.

J. H. Newbury, Goshen, N. Y., has purchased additional ground and will build an addition to his foundry.

The Canton Drop Forge & Machine Co., Canton, O., has secured a new site and work on its new buildings has been commenced.

Contracts have been awarded for the new building for the Forest City Steel & Iron Co., on the West Side, Cleveland.

A new boiler house will be erected at the works of the W. S. Tyler Co., Cleveland. It will be 55x57 feet, two stories.

Plans have been prepared for a machine shop and other buildings for the Cleveland, Painesville & Ashtabula Railroad, to be erected at Painesville, O.

The Stockton Iron Works, Stockton, Ind., has purchased land and will erect a new plant.

The Mount Pleasant Tool Co., Mount Pleasant, Pa., recently incorporated, is now building a plant and has equipment purchased.

The Pittsburg and Valley Districts:—

The Pleasant Valley Coal Co., of Crafton, W. Va., has been incorporated with $200,000 capital. The incorporators are S. M. Brown, S. W. Shrader, C. Gramm, E. Shrader and J. W. Miller.

The Harris Press Works, Niles, O., will erect a machine shop 40x104 feet.

The National Coal & Coke Co., of Pittsburg, Pa., has been organized with $5,000,000 capital and $2,500,000 bonds for the purpose of developing 10,000 acres of coal land in the Klondike regions of Pennsylvania, adjoining the Connellsville vein and erecting and operating 800 coke ovens. The company has 1,700 acres of coking coal and 300 acres of surface coal on the Monongahela river adjoining the properties of the American Coke Co. Two mines will be opened on the property immediately and two coking plants of 400 ovens each will be built. This company also owns all of the stock of the Indianola Coal Co. and the Allegheny & Western Connecting Railroad Co. The Indianola company owns 8,500 acres of Freeport coal and 100 acres of surface in Indiana township. Selwyn M. Taylor has been elected president; A. A. Thompson, treasurer; W. P. Kellett, secretary, and John P. Brennen, general manager. The directors of the company are Selwyn M. Taylor, J. V. Thompson, W. C. Magee, A. C. Munhall, S. R. Shipley, John P. Brennen, W P. Kellett, J. W. Allison and W. O. McNary. Operations will be commenced immediately and efforts will be made to make the first coke shipments shortly after the first of the year.

The briquetting plant which the Henry S. Mould Co. is erecting for the Jones & Laughlin Steel Co. at the Eliza blast furnace plant, Pittsburg, is fast nearing completion. Flue dust and fine ores will be briquetted and charged into the furnaces.

The Hoult Coal & Coke Co., of Dunbar, Pa., has been organized for the purpose of developing 237 acres of coal land at Hoult, W. Va. A coking plant will also be built. Bernard O'Connor is president; A. C. Duncan, vice president; H. A. Knotts, secretary, and S. H. Patterson, treasurer.

The High House Coal & Coke Co., of Uniontown, Pa., has been organized for the purpose of developing 122 acres of coal land near Uniontown and erecting a coking plant. W. T. Barker, of Fayette City, Pa., is president and L. D. Sisler, secretary and treasurer.

The Powell Coal & Coke Co., Pittsburg, will have its first block of ovens at Powell Station, W. Va., ready for operation about Sept. 1. The first battery to be lighted contains 200 ovens and a large number in addition are to be built.

The finishing mills of the Republic Iron & Steel Co., Youngstown, O., resumed operations this week, after an idleness of three weeks, extensive repairs having been made. The Bessemer plant, which is being practically rebuilt and increased in capacity, will not be ready for operation before September and the work may not be completed before Oct. 1. A stock of fully 10,000 tons of billets is on hand, however, to tide over the finishing mills until the Bessemer plant can be completed, and should this supply prove inadequate steel will be purchased in the open market.

The plant of the Wheeling Steel & Iron Co., Wheeling, W. Va., was shut down Saturday, July 25, for repairs.

The McLain Fire Brick Co., of Pittsburg, has been organized with $50,000 capital and has taken over the Buckeye Brick Company's plant at Wellsville, O. The plant is to be entirely rebuilt and the capacity increased from 30,000 to 50,000 daily. The incorporators of the company are H. E. McLain, W. W. Cromer, E. S. McLain & Son, J. H. Smith and C. C. Evans.

The new plant of the Damascus Brake Beam Co., Sharon, Pa., will be placed in operation in about ten days. Nearly all of the necessary machinery has been installed and orders on hand will keep the plant in operation for some time.

The Hausman & Wimmer Co., of Pittsburg, will receive a Pennsylvania charter on Aug. 5 to deal in scrap iron and steel. The incorporators of the company are Samuel Hausman, Joseph Wimmer and Charles Lavine.

The new stack of the LaBelle Works, Steubenville, O., is averaging from 330 to 350 tons daily and it is expected that this output will shortly be increased to 400 tons. The company's coking plant in Fayette County, Pa., is nearing completion and will be fired about Aug. 1. All of the coke required by the company will then be furnished by its own plant.

The Occident Coal & Coke Co., of Pittsburg, Pa., was incorporated in West Virginia with a capital of $150,000. The incorporators are Thomas Reynolds, A. Panderson, K. W. Daly, N. Newcome and W. M. Henderson.

The Anderson-Du Puy plant of the Crucible Steel Co. of America, McKees Rocks, Pa., will be dismantled within a few months, as the property has been purchased by the Pittsburg & Lake Erie Railroad for yard extensions. The Schultz plant of the American Bridge Co. is also to be removed. The Pennsylvania Railroad Co. is negotiating for the purchase of the Howe-Brown property of the Crucible Steel Co. of America on Penn Ave., and if this is secured it is altogether probable that the Crucible company will erect a large finishing plant at Clairton, Pa., so as to be nearer to its steel supply. The West Homestead plant of the American Bridge Co. is to be dismantled about the first of the year, the property having been purchased by the Mesta Machine Co.

General Industrial Notes:—

Repairs have been made in the plant of the Pittsburg Foundry & Machine Works, Pittsburg, Kan., recently damaged by fire, and the plant is now in full operation.

The J. H. Gillon Machine Co., Waycross, Ga., has begun operations in its new foundry, which is about three times as large as the foundry building formerly occupied.

The Denver Steel Casting Co., Denver., Col., recently incorporated, has absorbed the Colorado Steel Casting Co., which was organized some time ago. The latter company owns all the rights of the Atlas Car Coupling Co. The concern will at once begin work on a new plant in Denver, and it is expected that it will ultimately employ several hundred men.

The American Seeding & Machine Co., Springfield, O., will establish a plant and branch office at Brantford, Ont.

The American Tube & Stamping Co., Bridgeport, Conn., made its first steel a few days ago. The concern has a modern plant, with about 300 employes, and the start has been satisfactorily made.

The Battle Creek Iron Works Co., Ltd., Battle Creek, Mich., has secured the contract for furnishing all the castings for the Grand Trunk Western Railway Co. The railway company will require about 150 tons of castings each month.

The Cleveland Automatic Stoker Co., Toledo, O., has sold its first Toledo-built machine. The company planned to locate its plant in Cleveland, but the Toledo investors in the company succeeded in having the plant located in their city.

At the recent meeting of the stockholders of the Niles Car & Mfg. Works, Niles, O., General Manager Robbins made a report for the past 6 months showing that all the old contracts were nearly completed and work will soon be commenced on the new contracts.

The American Tube & Stamping Co. has completed its new plant in East Bridgeport, Conn. The company now has three separate plants in Bridgeport and employs nearly 1,200 hands. The billet mill, now operated for the first time, is supplied with power from a 7,000-horsepower double-reversing engine.

The Damascus Nickel Steel Co., which has for several months been enlarging its plant at Carnegie, Pa., hopes to be able to start its new 10-inch and 16-inch mills and also the open-hearth furnace, which is nearly completed, by the 15th of August.

The Rotary File & Machine Co., 423 Kent Av., Brooklyn, N. Y., recently incorporated, is at present manufacturing and putting on the market, a line of newly invented, and patented machines for automatically sharpening saws and serrated cutters of every kind. The company does not contemplate moving its present plant or rebuilding in the immediate future.

The Pease Engine & Machine Works Co., Goshen, Ind., advises us that the condition of the business is such that it must, if it intends to fill its orders, increase the capacity of its plant to double or treble what it is now. The company has not fully decided whether it will change the location of its plant or merely increase the capacity of its present buildings.

S. B. Patch & Sons, Streator, Ill., report that their foundry department is very much rushed filling orders for rocker and shaking grates. The company is sending these grates to all parts of the world.

The recent increase of the capital stock of the Indiana Shovel Co., New Castle, Ind., was made in order to merge that company and the Xenia Handle Co., Xenia, O., into the corporation of the Indiana Rolling Mill Co. Heretofore they were three distinct corporations but will now be known as the Indiana Rolling Mill Co., which manufactures its own steel, as well as its own handles, and has a capacity of 300 dozen shovels each ten hours.

Major W. H. Bixby, corps of engineers, United States army, is at work estimating the probable cost of the construction of a third lock at Sault Ste. Marie. It will be between $6,000,000 and $8,000,000.

The new Lavelle Foundry Co., Anderson, Ind., started operations a few days ago. The plant is well equipped for handling a general line of foundry work.

The Velox Machine Co., Chicago, contemplates moving to Milwaukee. It is stated that about $15,000 has been raised in Milwaukee for the extension of the plant.

The Cuyahoga Wire & Fence Co., with plants at Cuyahoga Falls., O., and New Castle, Pa., has just removed its offices from Cuyahoga Falls to New Castle, and has in contemplation a number of changes in its business.

The Manitoba Iron Works, Winnipeg, Manitoba, made its first castings a few days ago. The company has started work with a good list of orders and its prospects are excellent.

Henry A. Burtt, commissioner, has sold the foundry of the George S. Anderson & Bros. Co., of Jeffersonville, Ind., to the G. S. Anderson & Co., for $2,300.

The Peninsular Stove Co., of Detroit, having a capital of $2,000,000, has been incorporated. The company has been in business for many years, but was not incorporated until recently.

The stockholders of the Richford Foundry Co., Richford, Vt., have declared their semi-annual dividend of 5 percent.

The Blakeslee Mfg. Co., Birmingham, Ala., has been absorbed by the White-Blakeslee Mfg. Co., in the same city. The capital of the combined concern is $200,000. The company will continue the manufacture of gasoline engines, veneer machinery and pumps. The officers of the company are: C. B. White, president; J. Brown, vice president; J. B. Scully, secretary, and R. E. Lockett, treasurer.